1981 YEAR-END ELECTRIC POWER SURVEY

A Report of the Electric Power Survey Committee of the

EDISON ELECTRIC INSTITUTE The association of electric companies

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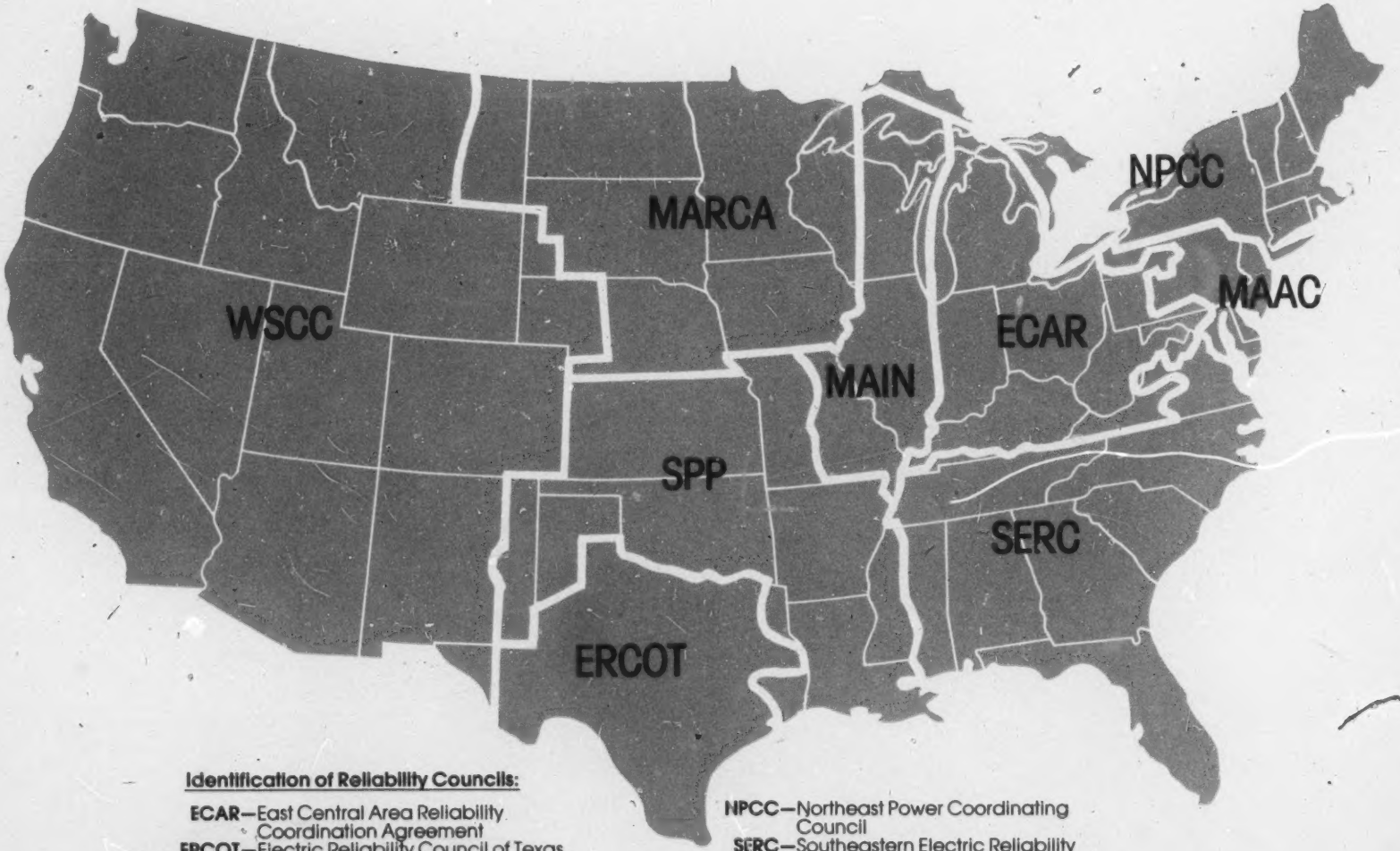
Regional Reliability Councils of the National Electric Reliability Council



Identification of Reliability Councils:

ECAR—East Central Area Reliability Coordination Agreement
ERCOT—Electric Reliability Council of Texas
MAAC—Mid-Atlantic Area Council
MAIN—Mid-America Interpool Network
MARCA—Mid-Continent Area Reliability Coordination Agreement
NPCC—Northeast Power Coordinating Council
SERC—Southeastern Electric Reliability Council
SPP—Southwest Power Pool
WSCC—Western Systems Coordinating Council

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1981 YEAR-END POWER SURVEY

FOREWORD

This report presents information concerning the electric power supply, expansion of electric generating facilities, and the manufacture of heavy electric power equipment in the United States as of the end of 1981.

The historical data for 1980 and preceding years are an accurate presentation of the peak load, capability to meet load, and kilowatt-hour requirements for these time periods. Data for 1981 are the best figures available at this time. In view of considerations involving potential regulatory delays, unanticipated changes in environmental requirements, and other factors, it should be recognized that estimates of scheduled additions to generating capacity and shipments by equipment manufacturers may be subject to change.

The data are based on the 1981 year-end survey made by the Electric Power Survey Committee of the Edison Electric Institute in cooperation with representatives of the electric power systems or power areas throughout the contiguous United States, the State of Hawaii, the nation's principal manufacturers of heavy electric power equipment, and foreign manufacturers of such equipment with orders from U.S. electric power systems.

Data in this survey represent the entire electric utility industry of the contiguous United States, including investor-owned systems and those of governmental agencies – Federal, Municipal and State & Local – and also rural electric cooperatives. With the switch from EEI-collected to NERC-collected ten-year projections of capability, peak, and kilowatt-hour data in the 1981 Annual Electric Power Survey of last April, blow-up factors formerly used to expand the sum of the nine regions to values entitled "Total Electric Utility Industry of the Contiguous United States" were dropped as they were no longer considered necessary. Even though the December capability and peak values published in these Year-End Electric Power Surveys are obtained from EEI's own turn-of-year survey (rather than from NERC), the new format omitting a second set of expanded and rounded totals for the lower 48 states will be maintained.

The survey also includes industrial power installations whose operations are coordinated with the utility systems with which they are interconnected and which contribute to the public supply. It does not include any isolated industrial or institutional power installations.

Results pertaining to power system capabilities, peak loads, capability margins, and kilowatt-hour requirements are presented for each of the nine reliability councils of the North American Electric Reliability Council. Boundaries of the NERC councils are shown by the map in Fig. 1. The North American Electric Reliability Council encompasses essentially all utility systems in the United States and five Canadian provinces, but *the data presented in this survey cover only the systems in the contiguous United States*. Summations of these regional data are presented and referred to as "Survey Totals for the Nine Regions."

Survey data for the State of Hawaii are presented separately.

The data regarding summer 1981 peak loads and capabilities, and the 1981 kilowatt-hour requirements, are preliminary and subject to possible revision when more detailed records become available. Final values will be presented in the Committee's 1982 Annual Electric Power Survey report as of April 1, 1982.

Data in this survey report pertaining to the manufacture, in the United States, of heavy electric power equipment for all classes of customers represent substantially all such manufacture in this country.

Information concerning electric generating units ordered abroad for public utility service in the United States is furnished by representatives of foreign manufacturers as well as by the domestic power systems which have ordered them.

SUMMARY OF 1981 ACCOMPLISHMENTS

During the year 1981, the electric power systems of the contiguous United States placed 15.2 million kilowatts of additional electric generating capacity into commercial operation. This includes all units of 4,000 kilowatt capacity and larger. Of this total, 5 units aggregating 0.3 million kilowatts are hydraulic, and 40 units aggregating 14.9 million kilowatts are thermal. Four of the thermal units were powered by nuclear fuel. Twenty-five are conventional steam turbine-generators, 8 are combustion turbine-generators, and three are diesel engine-generators. The individual generating units that make up the 15.2 million kilowatts added during 1981 are identified in Appendix I.

This newly added capacity contributed to the increase in the total capability, or load-carrying ability, of the U.S. electric power systems to 570.2 million kilowatts at the year end – an increase of 0.4 percent over the total at the end of 1980.

Of the total capability of 570.2 million kilowatts, approximately 88 percent is thermal and the rest hydraulic. During the past seven years, the total capability of the country's electric power systems has increased at an average annual rate of 3.3 percent.

The combined December 1981 peak load of the contiguous United States was 360.9 million kilowatts – 0.5 percent above the December 1980 peak load. The increase in December peak load during the past seven years, from December of 1974, was 72.5 million kilowatts. This gives an average annual increase of 3.3 percent during the past seven years.

Of the thirteen reporting entities (regions and subregions) contributing data to this survey, only NEPOOL experienced unseasonably warm weather at the time of their December peak load; the other 12 areas experienced normal temperatures.

The combined 1981 summer peak load, shown in Table II of this report, was 70.4 million kilowatts or 19.5 percent higher than the 1981 December peak load. This is the eighteenth consecutive year during which the combined summer peak load exceeded the peak of the following December.

The December 1981 margin of generating capability over peak load in the contiguous United States was 58.0 percent. It was higher by 25.4 percentage points than the capability margin that existed at the time of the 1981 summer peak load. This was brought about by the fact that the total capability at the time of the December 1981 peak load was 1,881 kilowatts lower than it was at the time of the 1981 summer peak load and, at the same time, the 1981 December peak load was 70.4 million kilowatts lower than the 1981 summer peak load.

During 1981 the kilowatt-hour requirement for the contiguous United States amounted to 2.3 trillion kilowatt-hours – 0.1 percent higher than the output of 1980. During the past seven years, total kilo-

watt-hour requirements of the country's electric power systems have increased at an average annual rate of 3.1 percent.

The 1981 annual load factor for the sum of the nine regions was 60.7 percent.

Including the states of Alaska and Hawaii, and power sources maintained in the United States exclusively for industrial purposes, the nation's total electric generating capability was approximately 615 million kilowatts at the 1981 year-end.

FUTURE EXPANSION PROGRAM

During 1981 the electric power systems removed from the expansion program 20 nuclear units totaling 24,593 megawatts and 6 conventional steam turbine-generators totaling 3,511 megawatts. During the same twelve-month period the electric power systems also deferred by a year or more 54 steam turbine-generators, 300 megawatts or larger, totaling 43,563 megawatts, of which 18 units, totaling 21,210 megawatts, were nuclear.

As of January 1, 1982, the electric power systems serving the contiguous United States had on order with both domestic and foreign manufacturers, and scheduled for commercial operation during 1982 and later years, a total of 170.0 million kilowatts. This included 75 hydraulic units of both conventional and pump-storage type, totaling 7.7 million kilowatts. The thermal units include steam turbine-generators, of both conventional and nuclear types, combustion turbine-generators, and diesel engine-driven generators. Some of this capacity is on site and being installed; the remainder is under manufacture or in the form of firm orders.

Another 40 units, totaling 15 million kilowatts, are also on order but are either awaiting their first assignment of a scheduled date of commercial operation by the utility systems, or were once scheduled and have since been removed from the expansion program. It is probable that the majority of the orders in the second category (being held open as options by the manufacturers) will not be reactivated.

Of the total 162.3 million kilowatts of thermal capacity on order as of January 1, 1982, and scheduled for service, steam turbine-generators in sizes 700,000 kilowatts and larger account for 67.6 percent of the total. Among the units under 100,000 kilowatts, there are 7 steam turbine-generators with an aggregate capacity of 340 mw, 5 combustion turbine-generators, aggregating 353 mw, and one diesel engine-generator, rated at 6 mw.

MANUFACTURE OF HEAVY ELECTRIC POWER EQUIPMENT IN THE UNITED STATES

During 1981, orders for new electric generating units, steam and hydraulic, placed with domestic manufacturers by all classes of customers totaled 47 machines aggregating 11.1 million kilowatts. U.S. electric utilities accounted for 61.2 percent of this total capacity. Orders placed in 1981 with foreign manufacturers by U.S. electric power systems consisted of twelve fossil-fired steam turbine-generators totaling 1.3 million kilowatts and seven generators for hydraulic turbines totaling 74.1 megawatts.

Production by domestic manufacturers during the year 1981 amounted to 15.5 million kilowatts, of which 12.8 million kilowatts were delivered to U.S. electric power systems. The total production scheduled as of January 1, 1982, for all classes of customers amounts to 217 units totaling 104.5 million kilowatts. The manufacturing schedules for 1982, 1983, and 1984 call for 15.2 million kilowatts, 14.4 million kilowatts, and 13.5 million kilowatts, respectively. The present 1985 and 1986 schedules are 9.6 million kilowatts and 46.6 million kilowatts. The 1987 and later schedule, up to now, calls for the production of 7 units totaling 5.1 million kilowatts.

PART 1/ELECTRIC POWER SUPPLY

PEAK CAPABILITIES, PEAK LOADS, AND RESERVE MARGINS

The December 1981 peak loads, the capability of the power systems at the time of these loads, and the corresponding capability margins are shown in Table I, page 8, together with data for each of the seven previous years. A graphic presentation of the December situation for the contiguous United States from 1948 through 1981 is shown on page 7.

The 1981 summer peak capabilities, peak loads, and capability margins are given in Table II, page 9, together with corresponding data for the previous seven years.

The 1981 kilowatt-hour requirements and annual load factors, together with corresponding data for the previous seven years, are given in Tables IV and V, page 11.

CAPABILITIES

Regional capabilities presented in this report are the sum of the actual load-carrying abilities of the systems, or power pools, serving the region at the time of the peak load with all power sources available, that is, without any allowance for outages that may have existed during the peak period. Allowances for any such outages are provided for by the capability margin, which is the difference between the full capability and the actual peak load. Where hydro generating facilities are involved, the regional capabilities shown take account of the actual hydro conditions prevailing during the peak period.

Included in the capabilities are the load-carrying abilities of those industrial power generating facilities that are interconnected with the utility systems, or power pools, and whose operations are coordinated with them. Also included is any capability from other sources which is assured to the utility systems, or power pools, during the peak period by contractual agreement. All such capability contributes, or may contribute, to the public supply.

Capabilities as presented herein, therefore, present a true picture of the load-carrying ability of facilities provided by the power systems to carry the peak loads.

These capabilities may differ from other compilations in which certain allowances for reserves have been made and in which the load-carrying ability of hydro equipment is based upon adverse water conditions. They may differ also from compilations of installed generating capacity based upon manufacturers' nameplate ratings of the generators, the prime movers, or the combinations of generator and prime mover.

Capability as used herein represents the actual load-carrying ability of the generating equipment and systems as a whole, as determined by actual experience, or, in the case of new equipment, estimated from the best available information.

PEAK LOADS

Regional peak loads as reported herein represent coincident peaks insofar as existing interconnecting facilities and operations make this meaningful and practicable. The regional peak loads given are the sum of the actual peaks of the systems serving the region, including formally organized power pools, interconnected system groups whose operations are coordinated, and, in some cases, smaller systems including certain municipals which operate independently or non-coordinated.

Where power pools or interconnected groups include industrial generating facilities whose operations are coordinated with those of the interconnected utilities, the loads on such facilities are included in the peak load of the group on a coincident basis.

Thus, the regional peak load data are representative of conditions as they actually existed irrespective of ownership of the systems or other statistical classification. These data are directly comparable with the regional capabilities presented in this report and discussed above.

CAPABILITY MARGINS

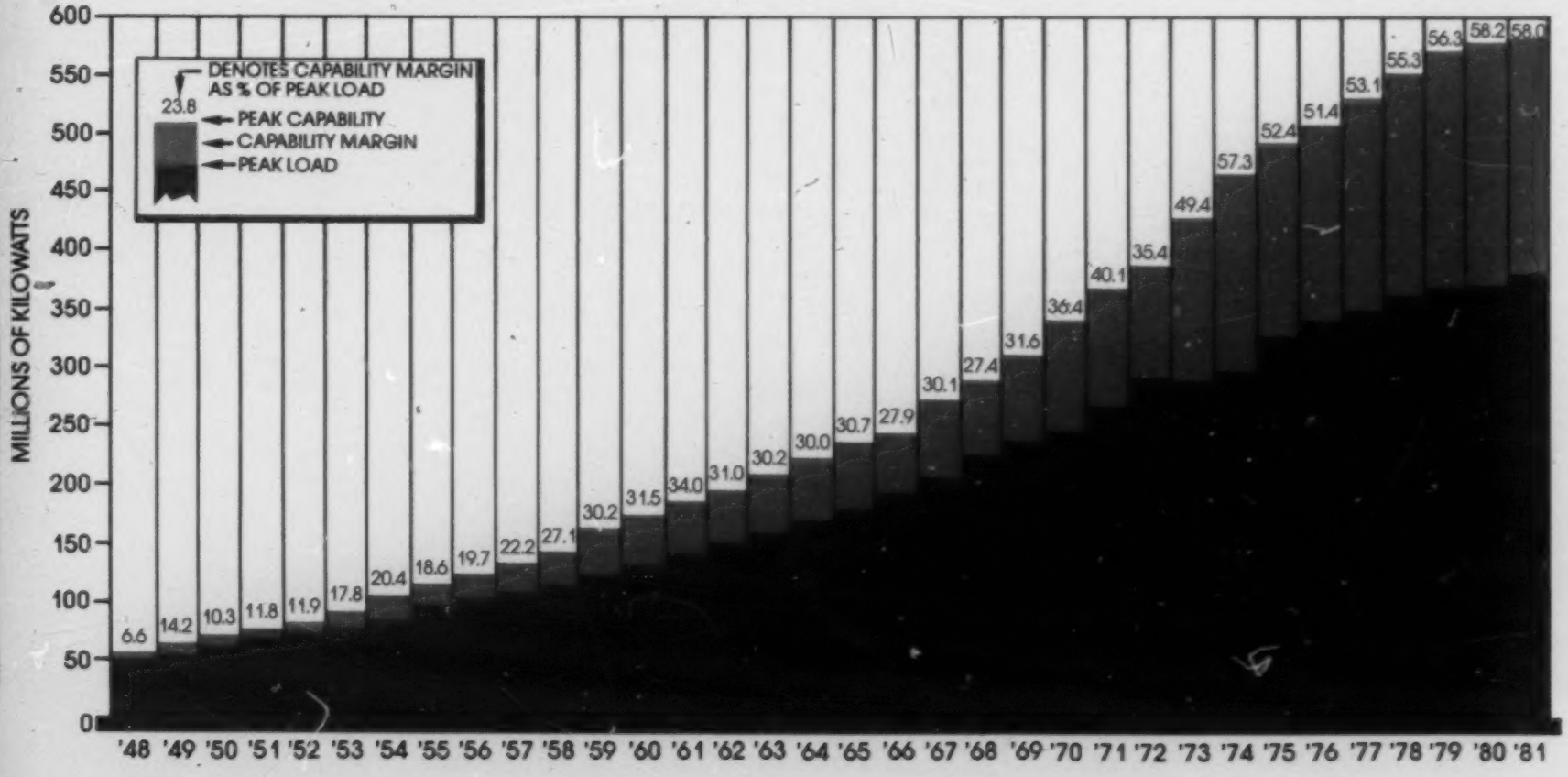
Capability margins, in megawatts, presented in this report represent the difference between capability and peak load as described above. Capability margin expressed in percentage terms is calculated by dividing this difference by the peak load.

Capability margins include the provisions for emergency outages, any necessary maintenance during peak periods and for system operating requirements. The remainder, after these needs are met, is available for unforeseen loads and for load growth.

It is well to keep in mind that maximum regional loads do not occur in all cases in summer—in some cases they occur in December or January. Thus, while the capability margin for the country as a whole in summer gives a true picture of the electric power situation *at that time*, it does not reflect the fact that maximum regional loads in some cases have occurred in winter. Likewise, the December capability margins shown in this report for the total of the nine regions do not reflect the fact that maximum regional loads in some cases have occurred in summer.

It is also true that the regional capability margins (and hence the capability margin for the sum of the regions) in summer or winter have not always represented the minimum or the maximum capability margin. The extremes of capability margins may be influenced, for example, by the date of bringing new large generating facilities into commercial operation in relation to the time of the annual peak loads—the addition of a very large generating unit just before the peak could give a larger capability margin during the peak period than that which existed before the time of peak. Also, in areas having high proportions of hydroelectric generating capacity, the lowest margins may occur at times other than when the load is at a maximum because of low capability resulting from minimum water for power generation.

December Peak Capabilities, Peak Loads, and Capability Margins – Total Electric Utility Industry of the Contiguous United States.



Peak Capability represents the maximum kilowatt output with all power sources available. It must, therefore, provide the necessary allowance for maintenance, emergency outages and system operating requirements.

Capability Margin includes the provision for maintenance, emergency outages and system operating requirements. Any remainder, after these needs are met, is available for unforeseen loads.

Note: All values indicated are for December and do not reflect the fact that the maximum loads in some regions occur in summer.

Table I DECEMBER CAPABILITIES, PEAK LOADS, AND RESERVE MARGINS (Thousands of Kilowatts)

Regions		1974	1975	% Inc	1976	% Inc	1977	% Inc	1978	% Inc	1979	% Inc	1980	% Inc	1981[1]	% Inc
NPCC	Capability	45,998	48,265	4.9	51,360	7.0	52,167	1.0	52,850	1.3	53,152	0.6	52,897	0.5–	53,028	0.2
	Peak Load	30,219	31,607	4.6	33,804	7.0	33,767	0.1–	33,674	0.3–	34,622	2.8	33,780	2.4–	32,957	2.4–
	Capability Margin	15,779	16,658		17,826		18,400		19,176		18,530		19,117		20,071	
	Capability Margin, %	52.2*	52.7*		52.7*		54.5*		56.9*		53.5*		56.6*		60.9*	
MAAC	Capability	40,720	43,786	7.5	44,183	0.9	47,034	6.5	47,292	0.5	45,039	4.8–	45,379	0.8	45,393	0.0
	Peak Load	23,352	24,704	5.8	26,649	7.9	26,723	0.3	26,806	0.3	27,858	3.9	27,550	1.1–	27,393	0.6–
	Capability Margin	17,368	19,082		17,534		20,311		20,486		17,181		17,829		18,000	
	Capability Margin, %	74.4*	77.2*		65.8*		76.0*		76.4*		61.7*		64.7*		65.7*	
ECAR	Capability	71,915	75,085	4.4	77,799	3.6	83,450	7.3	87,540	4.9	88,893	1.5	90,850	2.2	89,655	1.3–
	Peak Load	50,033	53,500	6.9	57,465	7.4	59,136	2.9	58,500	1.1–	60,302	3.1	58,671	2.7–	56,093	4.4–
	Capability Margin	21,882	21,585		20,334		24,314		29,040		28,591		32,179		33,562	
	Capability Margin, %	43.7*	40.3*		35.4		41.1*		49.6*		47.4*		54.8*		59.8*	
SERC	Capability	94,682	100,114	5.7	101,974	1.9	106,987	4.9	109,487	2.3	115,475	5.5	113,950	1.3–	111,104	2.5–
	Peak Load	61,897	70,977	14.7	72,609	2.3	74,784	3.0	72,578	2.9–	74,963	3.3	77,130	2.9	80,856	4.8
	Capability Margin	32,785	29,137		29,365		32,203		36,909		40,512		36,820		30,248	
	Capability Margin, %	53.0*	41.1*		40.4*		43.1*		50.9*		54.0*		47.7*		37.4*	
MAIN	Capability	36,430	37,594	3.2	37,904	0.8	39,414	4.0	41,564	5.5	45,048	8.4	39,399	12.5–	39,798	1.0
	Peak Load	23,070	24,501	6.2	24,590	0.4	26,281	6.9	26,802	2.0	27,127	1.2	25,875	4.6–	25,908	0.1
	Capability Margin	13,360	13,093		13,314		13,133		14,762		17,921		13,524		13,890	
	Capability Margin, %	57.9*	53.4*		54.1*		50.0*		55.1*		66.1*		52.3*		53.6*	
SPP	Capability	37,014	39,787	7.5	39,772	0.0–	42,244	6.2	44,871	6.2	46,462	3.5	51,216	10.2	53,994	5.4
	Peak Load	20,193	23,405	15.9	23,421	0.1	25,226	7.7	26,800	6.2	28,810	7.5	28,770	0.1–	30,965	7.6
	Capability Margin	16,821	16,382		16,351		17,018		18,071		17,652		22,446		23,029	
	Capability Margin, %	83.3*	70.0*		69.8*		67.5*		67.4*		61.3*		78.0*		74.4*	
ERCOT	Capability	30,760	33,168	7.8	34,332	3.5	36,780	7.1	39,774	8.1	40,776	2.5	43,179	5.9	43,206	0.1
	Peak Load	14,549	16,136	10.9	17,389	7.8	17,950	3.2	20,805	15.9	21,477	3.2	21,658	0.8	23,030	6.3
	Capability Margin	16,211	17,032		16,943		18,830		18,969		19,299		21,521		20,176	
	Capability Margin, %	111.4*	105.6*		97.4*		104.9*		91.2*		89.9*		99.4*		87.6*	
	†Net Margin, %	35.5	27.2		48.7		61.3		30.8		37.6		54.5		59.4	
MARCA	Capability	17,698	19,252	8.8	20,246	5.2	21,802	7.7	22,961	5.3	25,077	9.2	26,948	7.5	27,992	3.9
	Peak Load	11,501	13,237	15.1	13,429	1.5	14,676	9.3	15,491	5.6	15,741	1.6	16,409	4.2	16,513	0.6
	Capability Margin	6,197	6,015		6,817		7,126		7,470		9,336		10,539		11,479	
	Capability Margin, %	53.9*	45.4*		50.8*		48.6*		48.2*		59.3*		64.2*		69.5*	
WSCC	Capability	78,612	84,252	7.2	90,216	7.1	90,767	0.6	97,425	7.3	98,860	1.5	104,101	5.3	106,005	1.8
	Peak Load	53,624	57,727	7.7	59,684	3.4	61,525	3.1	68,611	11.5	66,495	3.1–	69,223	4.1	67,195	2.9–
	Capability Margin	24,988	26,525		30,532		29,242		28,814		32,365		34,878		38,810	
	Capability Margin, %	46.6*	45.9*		51.2*		47.5*		42.0*		48.7*		50.4*		57.8*	
Survey Total for the Nine Regions[2]	Capability	453,829	481,303	6.1	498,056	3.5	520,645	4.5	543,764	4.4	558,782	2.8	567,919	1.6	570,175	0.4
	Annual Increase	33,075	27,474		16,753		22,589		23,119		15,018		9,137		2,256	
	Peak Load	288,438	315,794	9.5	329,040	4.2	340,068	3.4	350,247	3.0	357,395	2.0	359,066	0.5	360,910	0.5
	Annual Increase	6,755	27,356		13,246		11,028		10,179		7,148		1,671		1,844	
	Capability Margin	165,391	165,509		169,016		180,577		193,517		201,387		208,853		209,265	
	Capability Margin, %	57.3	52.4		51.4		53.1		55.3		56.3		58.2		58.0	

*Peak occurred in Summer †Percent Net Margin based on capability available for load after deductions for scheduled maintenance, seasonal unavailability of fuel, etc.

[1]Preliminary [2]These values are the sum of the regional survey totals for December and do not reflect the fact that maximum loads in some regions occur in summer as indicated.

Table II SUMMER CAPABILITIES, PEAK LOADS, AND RESERVE MARGINS (Thousands of Kilowatts)

Regions		1974	1975	% Inc	1976	% Inc	1977	% Inc	1978	% Inc	1979	% Inc	1980	% Inc	1981[1]	% Inc
NPCC	Capability	42,825	45,960	7.3	48,872	6.3	47,011	3.8–	50,71[illegible]	7.9	51,778	2.1	52,038	0.5	51,752	0.6–
	Peak Load	31,761	32,875	3.5	32,378	1.5–	35,448	9.5	34,876	1.6–	34,673	0.6	36,831	6.2	35,988	2.3–
	Capability Margin	11,064	13,085		16,494		11,563		15,835		17,105		15,207		15,764	
	Capability Margin, %	34.8	39.8		50.9		32.6		45.4		49.3		41.3		43.8	
MAAC	Capability	37,215	40,245	8.1	41,636	3.5	44,492	6.9	44,613	0.3	44,633	0.0	45,137	1.1	44,962	0.4–
	Peak Load	29,065	28,969	0.3–	29,264	1.0	32,306	10.4	31,812	1.5–	31,780	0.1–	34,525	8.6	33,633	2.6–
	Capability Margin	8,150	11,276		12,372		12,186		12,801		12,853		10,612		11,329	
	Capability Margin, %	28.0	38.9		42.3		37.7		40.2		40.4		30.7		33.7	
ECAR	Capability	69,998	75,510	7.9	76,204	0.9	79,447	4.3	86,469	8.8	86,532	0.1	87,416	1.0	89,902	2.8
	Peak Load	52,420	55,413	5.7	55,765	0.6	62,306	11.7	62,454	0.2	61,716	1.2–	63,021	2.1	64,122	1.8
	Capability Margin	17,578	20,097		20,439		17,141		24,015		24,816		24,395		25,780	
	Capability Margin, %	33.5	36.3		36.7*		27.5		38.5		40.2		38.7		40.2	
SERC	Capability	83,433	93,533	12.1	96,027	2.6	99,837	4.0	105,183	5.4	108,392	3.1	110,220	1.7	113,775	3.2
	Peak Load	70,622	73,359	3.9	74,286	1.3	79,502	7.0	81,689	2.8	83,209	1.9	89,815	7.9	91,715	2.1
	Capability Margin	12,811	20,194		21,741		20,335		23,494		25,183		20,405		22,060	
	Capability Margin, %	18.1	27.5		29.3		25.6		28.8		30.3		22.7		24.1	
MAIN	Capability	36,733	38,291	4.2	40,826	6.6	40,505	0.8–	42,294	4.4	44,395	5.0	42,737	3.7–	41,104	3.8–
	Peak Load	29,190	28,788	1.4–	30,510	6.0	32,560	6.7	33,222	2.0	33,751	1.6	33,894	0.4	32,635	3.7–
	Capability Margin	7,543	9,503		10,316		7,945		9,072		10,644		8,843		8,469	
	Capability Margin, %	25.8	33.0		33.8		24.4		27.3		31.5		26.1		26.0	
SPP	Capability	38,675	42,054	8.7	43,258	2.9	45,108	4.3	47,860	6.1	47,661	0.4–	51,509	8.1	55,889	8.5
	Peak Load	31,416	30,556	2.7–	33,764	10.5	36,426	7.9	39,191	7.6	37,607	4.0–	44,981	19.6	45,203	0.5
	Capability Margin	7,259	11,498		9,494		8,682		8,669		10,054		6,528		10,686	
	Capability Margin, %	23.1	37.6		28.1		23.8		22.1		26.7		14.5		23.6	
ERCOT	Capability	30,010	32,055	6.8	33,600	4.8	36,440	8.5	39,099	7.3	40,085	2.5	42,248	5.4	42,080	0.4–
	Peak Load	23,332	23,525	0.8	25,400	8.0	26,819	5.6	28,645	6.8	27,828	2.9–	31,722	14.0	32,840	3.5
	Capability Margin	6,678	8,530		8,200		9,621		10,454		12,257		10,526		9,240	
	Capability Margin, %	28.6	36.3		32.3		35.9		36.5		44.0		33.2		28.1	
MARCA	Capability	16,991	18,464	8.7	19,920	7.9	21,671	8.8	21,963	1.3	23,972	9.1	26,268	9.6	28,200	7.4
	Peak Load	13,706	14,503	5.8	14,938	3.0	16,873	13.0	18,021	6.8	18,132	0.6	19,378	6.9	18,945	2.2–
	Capability Margin	3,285	3,961		4,982		4,798		3,942		5,840		6,890		9,255	
	Capability Margin, %	24.0	27.3		33.4		28.4		21.9		32.2		35.6		48.9	
WSCC	Capability	77,693	81,831	5.3	86,643	5.9	89,399	3.2	94,719	6.0	97,880	3.3	100,966	3.2	104,392	3.4
	Peak Load	59,266	60,330	1.8	65,772	9.0	64,926	1.3–	68,719	5.8	69,728	1.5	72,891	0.3	76,211	4.6
	Capability Margin	18,427	21,501		20,871		24,473		26,000		28,152		28,075		28,181	
	Capability Margin, %	31.1	35.6		31.7		37.7		37.8		40.4		38.5		37.0	
Survey Total for the Nine Regions[2]	Capability	433,573	467,963	7.9	486,986	4.1	503,910	3.5	532,911	5.8	545,328	2.3	558,539	2.4	572,056	2.4
	Annual Increase	28,447	34,390		19,023		16,924		29,001		12,417		13,211		13,517	
	Peak Load	340,778	348,318	2.2	362,077	4.0	387,166	6.9	398,629	3.0	398,424	0.1–	427,058	7.2	431,292	1.0
	Annual Increase	5,438	7,540		13,759		25,089		11,463		205–		28,634		4,234	
	Capability Margin	92,795	119,645		124,909		116,744		134,282		146,904		131,481		140,764	
	Capability Margin, %	27.2	34.3		34.5		30.2		33.7		36.9		30.8		32.6	

*Peak load occurred in December

[1]Preliminary

[2]These values are the sum of the regional survey totals for summer and do not reflect the fact that maximum loads in some regions occur in December as indicated.

RELATIONSHIP BETWEEN SUMMER AND DECEMBER PEAK LOADS

The relationship between the summer and December peak loads in the various reliability regions of the country, and also in the country as a whole for the year 1981, is shown in the following tabulation together with similar data for eleven previous years. In this tabulation the summer peak load in each case is expressed as a percentage of the December peak load for the same calendar year.

Through the first half of the 1960's, the magnitude of the summer peak load for more than half of the regions was characteristically about the same as that of the peak during the December which followed. Therefore, the former expressed as a percentage of the latter gave a value close to 100 percent. In those regions where the summer peak load was characteristically higher than the peak during the following December, the percentage figure was naturally above 100 percent.

After 1964 there was a departure from the equality of summer and December peaks experienced in the early 1960's. In most regions summer peaks generally exceeded the peaks for the December that followed by increasing amounts. As can be seen from the tabulation, the summer/December ratio jumped to 119 percent in 1973, due to the unprecedented drop in the December peak from the year previous. There was a change of only one percentage point in the relationship between the summer and December peak loads in 1974. The ratio dropped back to a more normal 110 percent in 1975 and 1976, rose to 113 percent in 1977, 114 percent in 1978, and declined to 113 percent in 1979.

In 1980, a hot summer and depressed year-end economic conditions resulted in a national summer/December ratio that matched the record 119 percent experienced in 1973. In 1981, the difference between the two seasonal peaks increased another percentage point to a record 120, but the 1981 disparity was more a function of the December peak increasing only 0.5 percent for the second year in a row due to depressed economic conditions, and not to a hot summer.

Table III SUMMER PEAK LOADS EXPRESSED AS PERCENTAGE OF PEAK LOAD FOR THE FOLLOWING DECEMBER

Regions	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981[1]
NPCC	96	101	98	114	105	104	96	105	104	100	109	109
MAAC	114	118	118	133	124	117	110	121	119	114	125	123
ECAR	102	107	103	112	105	104	97	105	107	103	108	114
SERC	111	109	108	109	114	103	102	106	113	112	118	113
MAIN	120	125	121	134	127	117	124	124	124	125	130	126
SPP	155	146	143	143	156	131	144	144	146	133	150	146
ERCOT	153	149	146	149	160	138	146	149	138	133	149	143
MARCA	110	112	110	120	119	110	111	115	116	115	118	115
WSCC	97	97	96	111	111	105	110	106	100	107	108	113
Total Electric Utility Industry of the Contiguous United States	111	112	110	119	118	110	110	113	114	113	119	120

[1] Preliminary

ANNUAL KILOWATT-HOUR REQUIREMENTS AND ANNUAL LOAD FACTORS

The 1981 kilowatt-hour requirements and annual load factors by reliability councils are given in Tables IV and V, together with corresponding information for the previous seven years.

The kilowatt-hour requirement represents utility net generation plus kilowatt-hours received from outside sources, including net imports from Canada and Mexico and energy from certain industrial installations which are interconnected and coordinated with the utility systems and which contribute to the public supply.

Table V ANNUAL LOAD FACTOR, %

Regions	1974	1975	1976	1977	1978	1979	1980	1981[1]
NPCC	65.3	63.0	64.1	62.5	65.1	66.4	63.0	64.7
MAAC	59.4	59.7	62.1	58.0	60.9	61.6	57.9	59.1
ECAR	68.7	67.0	69.9	67.0	66.7	70.1	66.2	65.2
SERC	61.7	60.6	63.4	63.1	62.7	63.0	60.8	59.0
MAIN	57.9	57.5	56.6	56.5	58.0	57.9	55.8	57.1
SPP	51.4	57.6	54.5	56.3	55.8	58.2	54.0	54.1
ERCOT	54.7	56.3	55.8	58.1	58.7	61.8	58.3	57.3
MARCA	59.8	63.3	61.7	58.0	58.6	60.8	56.6	58.8
WSCC	67.2	67.7	66.7	67.8	66.4	69.5	67.0	65.5
Survey Total for the Nine Regions	62.0	62.3	63.6	62.4	63.1	64.4	61.1	60.7

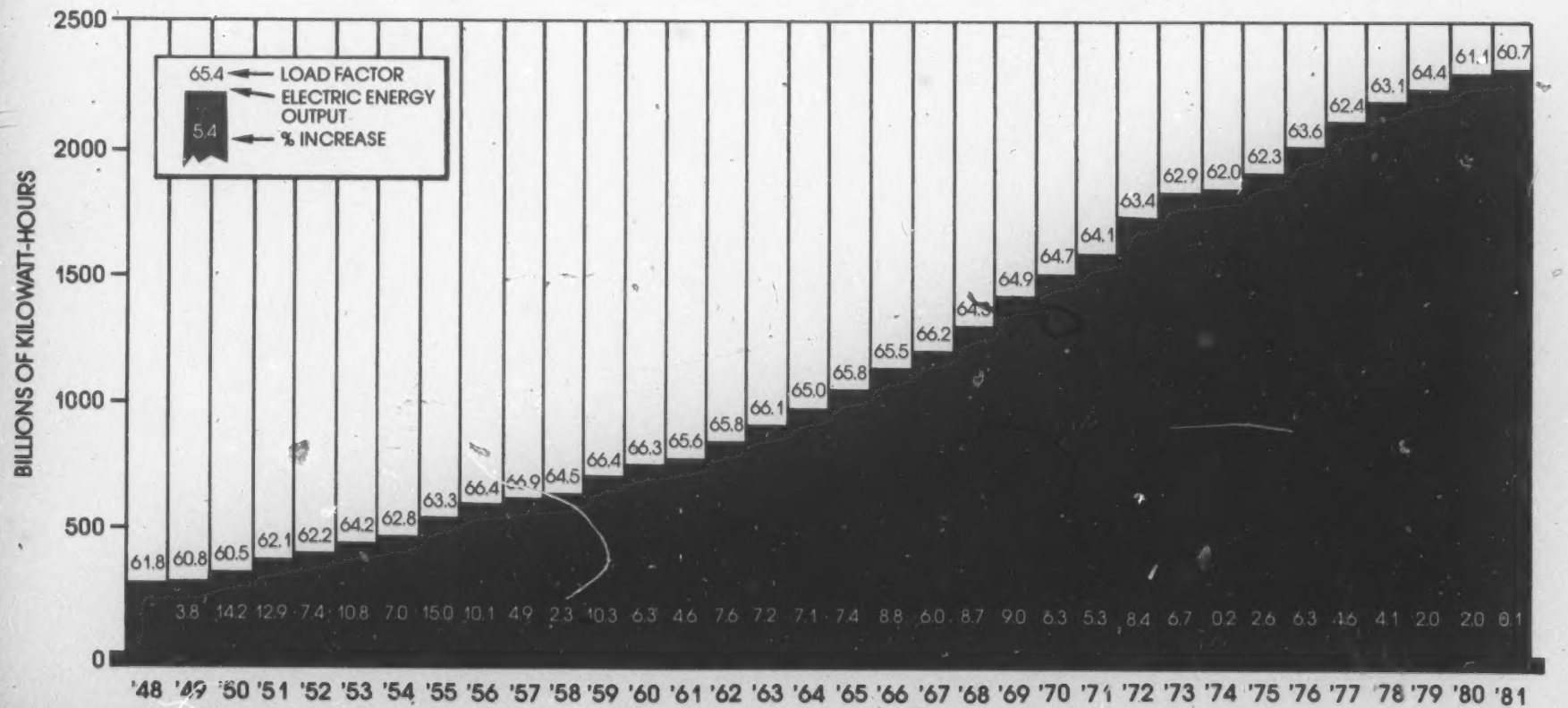
[1] Preliminary

Table IV ANNUAL KILOWATT-HOUR REQUIREMENTS, Millions

Regions	1974	1975	% Inc	1976	% Inc	1977	% Inc	1978	% Inc	1979	% Inc	1980	% Inc	1981[1]	% Inc
NPCC	181,709	181,494	0.1–	190,300	4.9	194,212	2.1	198,918	2.4	201,708	1.4	203,954	1.1	203,705	0.1–
MAAC	151,274	151,439	0.1	159,679	5.4	164,135	2.8	169,766	3.4	171,567	1.1	175,622	2.4	174,065	0.1–
ECAR	315,663	325,100	3.0	352,865	8.5	365,526	3.6	369,928	1.2	379,018	2.5	366,198	3.4–	365,970	0.1–
SERC	381,426	389,182	2.0	413,960	6.4	442,541	6.9	453,213	2.4	459,420	1.4	479,715	4.4	473,656	1.3–
MAIN	147,975	144,966	2.0–	151,623	4.6	161,081	6.2	168,808	4.8	171,052	1.3	166,116	2.9–	163,300	1.7–
SPP	141,414	154,223	9.1	161,769	4.9	179,549	11.0	191,550	6.7	191,762	0.1	213,381	11.3	214,361	0.5
ERCOT	111,783	115,989	3.8	124,600	7.4	136,413	9.5	147,371	8.0	150,533	2.1	162,327	7.8	164,899	1.6
MARCA	71,803	80,428	12.0	80,997	0.7	85,745	5.9	92,477	7.9	96,518	4.4	96,422	0.1–	97,597	1.2
WSCC	348,680	357,849	2.6	385,473	7.7	385,887	0.1	410,135	6.3	425,349	3.7	428,983	0.9	437,516	2.0
Survey Totals for the Nine Regions	1,851,727	1,900,670	2.6	2,021,266	6.3	2,115,089	4.6	2,202,166	4.1	2,246,927	2.0	2,292,718	2.0	2,295,069	0.1
Annual Increase	3,865	48,943		120,596		93,823		87,077		44,761		45,791		2,351	

[1] Preliminary

Electric Energy Output and Annual Load Factors – Total Electric Utility Industry of the Contiguous United States



ADDITIONS TO ELECTRIC GENERATING CAPACITY

The 1981 additions to electric generating capacity in the contiguous United States are shown in the top part of Table VI according to the type of generating units. The second portion of the table presents the same information arranged according to the reliability councils in which the new capacity was installed. The third portion of the table reports the same information classified according to ownership of the new units.

The top line of Table VII shows the total scheduled additions to electric generating capacity in the lower forty-eight United States as of January 1, 1982.

The second portion of Table VII shows the schedule arranged according to the expected year of commercial operation. The third portion of the table arranges the same information according to reliability councils in which the installations are scheduled to be made. The fourth part of the table presents the same data in terms of ownership of the equipment.

Table VI 1981 ADDITIONS TO ELECTRIC GENERATING CAPACITY In Terms of Manufacturers Ratings of the Units

	Thermal								Hydraulic					
	Steam Turbine-Generators				Combustion Turbine-Generators		Diesel Engine-Generators							
	Conventional		Nuclear						Conventional		Pumped-Storage		Total	
	Number of Units	Kw	Number of Units	Kw	Number of Units	Kw	Number of Units	Kw	Number of Units	Kw	Number of Units	Kw	Number of Units	Kw
TOTAL 1981 ADDITIONS	25	9,777,448	4	4,426,631	8	713,900	3	17,757	5	259,220	–	–	45	15,194,956
ADDITIONS BY REGION														
NPCC	1	215,000	–	–	1	95,000	–	–	–	–	–	–	2	310,000
MAAC	1	600,854	1	1,162,500	–	–	–	–	–	–	–	–	2	1,763,354
ECAR	5	1,109,606	–	–	1	72,900	1	5,757	–	–	–	–	7	1,188,263
SERC	4	1,806,273	3	3,264,131	1	23,500	–	–	–	–	–	–	8	5,093,904
MAIN	2	556,633	–	–	–	–	–	–	–	–	–	–	2	556,633
SPP	4	2,084,103	–	–	2	172,800	1	6,000	–	–	–	–	7	2,262,903
ERCOT	1	537,103	–	–	–	–	–	–	–	–	–	–	1	537,103
MARCA	4	1,735,341	–	–	–	–	1	6,000	–	–	–	–	5	1,741,341
WSCC	3	1,132,535	–	–	3	349,700	–	–	5	259,220	–	–	11	1,741,455
ADDITIONS BY OWNERSHIP														
Investor-Owned	12	6,285,841	3	3,243,439	5	536,900	–	–	–	–	–	–	20	10,066,180
Federal	–	–	1	1,183,192	–	–	–	–	5	259,220	–	–	6	1,442,412
Municipal	8	1,087,214	–	–	2	118,500	3	17,757	–	–	–	–	13	1,223,471
Cooperative	3	1,637,393	–	–	–	–	–	–	–	–	–	–	3	1,637,393
State and Local	2	767,000	–	–	1	58,500	–	–	–	–	–	–	3	825,500

Table VII SCHEDULED ADDITIONS TO ELECTRIC GENERATING CAPACITY BASED ON SCHEDULED DATES OF COMMERCIAL OPERATION AS OF JAN. 1, 1982 In Terms of Manufacturers Ratings of the Units

	Thermal								Hydraulic					
	Steam Turbine-Generators				Combustion Turbine-Generators		Diesel Engine-Generators						Total	
	Conventional		Nuclear						Conventional		Pumped-Storage			
	Number of Units	Number Kw	of Units	Kw	Number of Units	Kw	Number of Units	Kw	Number of Units	Kw	Number of Units	Kw	Number of Units	Kw
TOTAL SCHEDULED	149	81,177,052	69	79,681,571	8	1,437,250	1	6,000	52	2,376,732	23	5,317,402	302	169,996,007
SCHEDULED ADDITIONS BY YEARS AS OF JAN. 1, 1982														
1982	23	9,870,006	7	7,206,922	5	353,550	1	6,000	18	717,000	6	807,868	60	18,961,346
1983	18	8,057,435	12	13,310,874	–	–	–	–	19	731,882	1	350,000	50	22,450,191
1984	17	9,148,205	12	13,694,498	–	–	–	–	9	587,000	1	31,000	39	23,460,703
1985	19	9,513,148	8	8,973,896	–	–	–	–	6	340,850	5	1,103,934	38	19,931,828
1986	11	6,326,882	11	13,194,697	1	224,500	–	–	–	–	3	1,050,000	26	20,796,079
1987	14	7,428,498	5	5,957,692	–	–	–	–	–	–	3	847,800	22	14,233,990
1988 and later	47	30,832,878	14	17,342,992	2	859,200	–	–	–	–	4	1,126,800	67	50,161,870
SCHEDULED ADDITIONS BY REGIONS														
NPCC	3	2,205,565	5	5,615,596	2	147,860	–	–	6	53,650	–	–	16	8,022,671
MAAC	4	2,444,608	5	5,471,770	–	–	–	–	–	–	–	–	9	7,916,378
ECAR	25	14,974,013	9	9,043,614	1	26,050	1	6,000	2	50,000	–	–	38	24,099,677
SERC	24	14,749,420	19	21,875,225	–	–	–	–	13	734,012	13	4,074,600	69	41,433,257
MAIN	6	2,464,581	8	9,170,749	1	224,500	–	–	–	–	–	–	15	11,859,830
SPP	24	15,336,486	5	5,957,233	1	96,440	–	–	1	27,000	7	192,802	38	21,609,961
ERCOT	15	9,210,925	5	6,156,805	–	–	–	–	–	–	–	–	20	15,367,730
MARCA	12	5,395,745	–	–	–	–	–	–	1	49,970	–	–	13	5,445,715
WSCC	36	14,395,709	13	16,390,579	3	942,400	–	–	29	1,462,100	3	1,050,000	84	34,240,788
SCHEDULED ADDITIONS BY OWNERSHIP														
Investor-Owned	102	60,397,361	58	65,911,321	5	1,064,890	–	–	14	513,162	16	5,124,600	195	133,011,334
Federal	–	–	8	9,932,511	–	–	–	–	24	1,590,000	7	192,802	39	11,715,313
Municipal	15	6,503,928	–	–	2	147,860	1	6,000	8	114,100	–	–	26	6,771,888
Cooperative	23	10,731,932	–	–	1	224,500	–	–	–	–	–	–	24	10,956,432
State and Local	9	3,543,831	3	3,837,739	–	–	–	–	6	159,470	–	–	18	7,541,040

The accompanying bar chart shows the number and aggregate capacity of new thermal and hydraulic generating units placed in commercial operation in the contiguous United States during the years 1969 through 1980 and those scheduled for commercial operation during 1981 and later years.

The number and aggregate capacity of the thermal units in the expansion program as of January 1, 1981, are shown in the accompanying table entitled "Number and Aggregate Capacity of Thermal Units in Expansion Program, Grouped According to Size Range as of January 1, 1981."

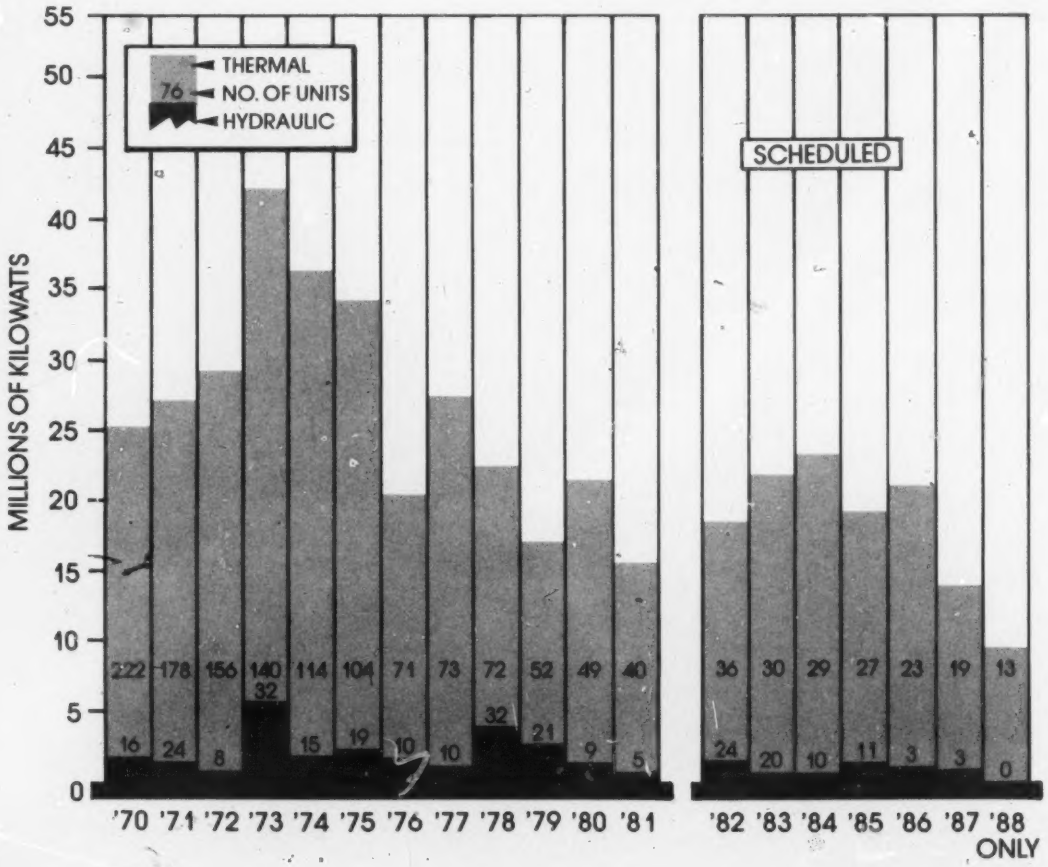


Table VIII NUMBER AND AGGREGATE CAPACITY OF THERMAL UNITS IN EXPANSION PROGRAM GROUPED ACCORDING TO SIZE RANGE AS OF JAN. 1, 1982 IN TERMS OF MANUFACTURERS RATINGS OF THE UNITS

Size Range, Kw	No. of Units	Aggregate Capacity, Kw	% of Total
1,300,000 Kw and Larger	17	22,562,410	13.9
1,200,000 to 1,299,999	13	15,966,042	9.8
1,100,000 to 1,199,999	26	30,130,329	18.6
1,000,000 to 1,099,999	4	4,354,232	2.7
900,000 to 999,999	6	5,791,419	3.6
800,000 to 899,999	24	19,803,918	12.2
700,000 to 799,999	15	11,025,295	6.8
600,000 to 699,999	31	20,005,117	12.3
500,000 to 599,999	31	16,334,778	10.1
400,000 to 499,999	21	8,895,896	5.5
300,000 to 399,999	10	3,618,825	2.2
200,000 to 299,999	9	2,166,162	1.3
100,000 to 199,999	7	948,000	.6
Under 100,000	13	699,450	.4
Total Thermal Units	227	162,301,873	100.0

STATE OF HAWAII

Combined 1981 peak loads, capabilities, and capability margins for December and summer, the 1981 kilowatt-hour requirements and the annual load factor of the systems serving the State of Hawaii are given below, together with similar data for previous years.

Table IX STATE OF HAWAII

	1974	1975	% Incr.	1976	% Incr.	1977	% Incr.	1978	% Incr.	1979	% Incr.	1980	% Incr.	1981[1]	% Incr.
							December Peak Capability, Peak Load, and Capability Margin – Thousands of Kilowatts								
Capability Scheduled	1,421	1,428	0.5	1,427	(0.1)	1,432	0.4	1,438	0.4	1,520	5.7	1,532	0.8	1,629	6.3
Annual Increase	185	7		(1)		5		6		82		12		97	
Peak Load	957	978	2.2	1,047	7.1	1,078	3.0	1,085	0.6	1,165	7.4	1,143	(1.9)	1,143	0.0
Annual Increase	24	21		69		31		7		80		(22)		0	
Capability Margin	464	450		380		354		353		355		389		486	
Capability Margin, %	48.5	46.0		36.3		32.8		32.5		30.5		34.0		42.5	
							Summer Peak Capability, Peak Load, and Capability Margin – Thousands of Kilowatts								
Capability Scheduled	1,236	1,421	15.0	1,427	0.4	1,426	(0.1)	1,438	0.8	1,515	5.4	1,524	0.6	1,650	8.3
Annual Increase	68	185		6		(1)		12		77		9		126	
Peak Load	908	918	1.1	981	6.9	999	1.8	1,055	5.6	1,103	4.5	1,073	(2.7)	1,096	2.1
Annual Increase	15	10		63		18		56		48		(30)		23	
Capability Margin	328	503		446		427		383		412		451		554	
Capability Margin, %	36.1	54.8		45.5		42.7		36.3		37.4		42.0		50.5	
							Annual Kilowatt-Hour Requirement in Millions of Kilowatt Hours								
Kilowatt-Hour Requirement	5,286	5,491	3.9	5,808	5.8	6,047	4.1	6,200	2.5	6,377	2.9	6,687	4.9	6,442	(3.7)
Annual Increase	275	205		317		239		153		177		310		(245)	
							Annual Load Factor, %								
	63.1	64.1		63.2		64.0		65.2		62.5		66.6		64.3	

[1] Preliminary

( ) Denotes decrease

NUCLEAR ELECTRIC POWER

As of the date of this survey, there were 75 nuclear units in commercial operation with a total winter rating of 55.6 million kilowatts. The individual units are listed in the accompanying tabulation. Four of the units, aggregating 4.2 million megawatts, came on line in 1981.

During 1981, no nuclear power reactors or nuclear steam turbine-generators were ordered by U.S. electric power systems.

As of January 1, 1982, nuclear capacity accounts for 47 percent of the aggregate of the industry's scheduled expansion program. The capacity on order from both domestic and foreign manufacturers and scheduled for commercial operation by U.S. electric power systems totals 7.2 million kilowatts in 1982 and 13.3 million kilowatts in 1983; in 1984 it stands at 13.7 million kilowatts. For 1985 and 1986, scheduled additions by U.S. power systems are 9.0 and 13.2 million kilowatts. For 1987 and later, scheduled additions by the U.S. electric power systems are pegged at 23.3 million kilowatts.

Table X NUCLEAR POWER UNITS IN THE CONTIGUOUS U.S. AS OF JANUARY 1, 1982

Name of System or Sponsor	Name or Location	Capability-MW		Type of Reactor	Placed in Commercial Operation
		Summer	Winter		
Duquesne Light Company	Shippingport No. 1	60	60	LWBR	1957
Commonwealth Edison Company	Dresden No. 1	197	207	BWR	1960
Yankee Atomic Electric Company	Yankee No. 1	175	176	PWR	1961
Consumers Power Company	Big Rock Point	63	63	BWR	1962
Pacific Gas & Electric Company	Humboldt Bay	63	63	BWR	1963
Washington Public Power Supply System	Hanford	840	840	GMWC	1966
Connecticut Yankee Atomic Power Company	Haddam No. 1	555	580	PWR	1968
Southern California Edison Company and San Diego Gas & Electric Company	San Onofre No. 1	436	436	PWR	1968
Jersey Central Power & Light Company	Oyster Creek No. 1	620	650	BWR	1969
Niagara Mohawk Power Corporation	Nine Mile Point No. 1	610	610	BWR	1969
Rochester Gas and Electric Corporation	Ginna No. 1	470	470	PWR	1969
Northeast Utilities	Millstone Point No. 1	654	660	BWR	1970
Wisconsin Electric Power Company	Point Beach No. 1	495	495	PWR	1970
Carolina Power & Light Company	Robinson No. 2	665	700	PWR	1971
Dairyland Power Cooperative	La Crosse	46	46	BWR	1971
Northern States Power Company	Monticello No. 1	536	557	BWR	1971
Commonwealth Edison Company	Dresden No. 2	772	794	BWR	1971
Boston Edison Company	Pilgrim No. 1	670	670	BWR	1972
Commonwealth Edison Company	Quad Cities No. 1	768	789	BWR	1972
Commonwealth Edison Company	Quad Cities No. 2	769	789	BWR	1972
Florida Power & Light Company	Turkey Point No. 3	666	696	PWR	1972
Maine Yankee Atomic Power Company	Wiscasset	814	830	PWR	1972
Vermont Yankee Nuclear Power Corporation	Vernon	496	528	BWR	1972
Virginia Electric & Power Company	Surry No. 1	775	775	PWR	1972
Commonwealth Edison Company	Dresden No. 3	773	794	BWR	1973
Consumers Power Company	Palisades No. 1	635	740	PWR	1973
Duke Power Company	Oconee No. 1	860	860	PWR	1973
Duke Power Company	Oconee No. 2	860	860	PWR	1973
Florida Power and Light Company	Turkey Point No. 4	666	696	PWR	1973
Northern States Power Company	Prairie Island No. 1	503	523	PWR	1973
Omaha Public Power District	Fort Calhoun No. 1	439	457	PWR	1973
Tennessee Valley Authority	Browns Ferry No. 1	1,067	1,067	BWR	1973
Virginia Electric & Power Company	Surry No. 2	775	775	PWR	1973
Wisconsin Electric Power Company	Point Beach No. 2	495	495	PWR	1973
Arkansas Power and Light Company	Arkansas Nuclear No. 1	836	836	PWR	1974
Commonwealth Edison Company	Zion No. 1	1,040	1,040	PWR	1974
Commonwealth Edison Company	Zion No. 2	1,040	1,040	PWR	1974
Consolidated Edison Company of NY, Inc	Indian Point No. 2	849	864	PWR	1974
Duke Power Company	Oconee No. 3	860	860	PWR	1974
Iowa Electric Light and Power Company	Arnold No. 1	480	510	BWR	1974
Metropolitan Edison Company	Three Mile Island No. 1	776	800	PWR	1974
Nebraska Public Power District	Cooper Nuclear No. 1	778	778	BWR	1974
Northern States Power Company	Prairie Island No. 2	500	520	PWR	1974
Philadelphia Electric Company	Peach Bottom No. 2	1,051	1,055	BWR	1974
Philadelphia Electric Company	Peach Bottom No. 3	1,035	1,035	BWR	1974
Wisconsin Public Service Corporation	Kewaunee No. 1	525	517	PWR	1974
Baltimore Gas & Electric Company	Calvert Cliffs No. 1	810	820	PWR	1975
Carolina Power & Light Company	Brunswick No. 2	790	790	BWR	1975
Georgia Power Company	Hatch No. 1	771	771	BWR	1975
Indiana & Michigan Electric Company	Cook No. 1	1,050	1,050	PWR	1975
Power Authority of the State of New York	Fitzpatrick No. 1	821	821	BWR	1975
Sacramento Utility District	Rancho Seco No. 1	875	903	PWR	1975
Tennessee Valley Authority	Browns Ferry No. 2	1,067	1,067	BWR	1975
Duquesne Light Company	Beaver Valley No. 1	800	800	PWR	1976
Florida Power and Light Company	St. Lucie No. 1	777	795	PWR	1976
Northeast Utilities	Millstone Point No. 2	864	864	PWR	1976
Portland General Electric Company	Trojan	1,080	1,080	PWR	1976
Power Authority of the State of New York	Indian Point No. 3	965	965	PWR	1976
Alabama Power Company	Farley No. 1	807	807	PWR	1977
Baltimore Gas & Electric Company	Calvert Cliffs No. 2	825	860	PWR	1977
Carolina Power & Light Company	Brunswick No. 1	790	790	BWR	1977
Florida Power Corporation	Crystal River No. 3	782	809	PWR	1977
Public Service Electric and Gas Company	Salem Nuclear No. 1	1,079	1,100	PWR	1977
Tennessee Valley Authority	Browns Ferry No. 3	1,067	1,067	BWR	1977
Toledo Edison Company	Davis-Besse No. 1	906	906	PWR	1977
Indiana & Michigan Electric Company	Cook No. 2	1,100	1,100	PWR	1978
Virginia Electric & Power Company	North Anna No. 1	898	907	PWR	1978
Georgia Power Company	Hatch No. 2	771	771	BWR	1979
Public Service Company of Colorado	Fort St. Vrain No.1	200	200	HTGR	1979
Arkansas Power & Light Company	Arkansas Nuclear No. 2	858	858	PWR	1980
Virginia Electric & Power Company	North Anna No. 2	870	870	PWR	1980
Alabama Power Company	Farley No. 2	812	812	PWR	1981
Duke Power Company	McGuire No. 1	1,180	1,180	PWR	1981
Public Service Electric & Gas Co.	Salem Nuclear No. 2	1,106	1,120	PWR	1981
Tennessee Valley Authority	Sequoyah No. 1	1,128	1,128	PWR	1981
TOTAL	75 Units	54,097	55,611		

BWR = Boiling Water Reactor
GMWC = Graphite Moderated Water Cooled Reactor
HTGR = High Temperature, Gas-Cooled Reactor
LWBR = Light Water Breeder Reactor
PWR = Pressurized Water Reactor

PART II/MANUFACTURE OF HEAVY ELECTRIC POWER EQUIPMENT

Data in this section of the report relate to the manufacture in the United States of heavy electric power equipment for U.S. electric power systems, U.S. industrials and for export to customers outside the United States. Information is also included on actual and scheduled imports of such equipment by U.S. electric power systems.

Orders placed with domestic and foreign manufacturers during 1981 for this type of equipment by U.S. electric power systems are shown in the accompanying Table XI, together with corresponding information for the previous four years.

Detailed data concerning 1981 orders, shipments, scheduled shipments, and total production backlogs as of January 1, 1982, are shown on the following pages, as well as data on imports of equipment by U.S. electric power systems.

Appendix II gives statistical data by quarters for the past three years regarding heavy electric power equipment shipments, orders, and production backlogs at the end of each quarter, but only for domestic manufacturers of such equipment.

Table XI CAPACITY OF HEAVY ELECTRIC POWER EQUIPMENT PLACED ON ORDER WITH DOMESTIC AND FOREIGN MANUFACTURERS BY U.S. ELECTRIC POWER SYSTEMS

		1977	1978	1979	1980	1981
Electric Generating Units (4,000 Kw and Larger)						
Steam Turbine-Generators, Kw						
Conventional		13,602,119*	18,332,703*	4,478,910	2,846,000*	7,919,854*
Nuclear		–	–	–	–	–
Combustion Turbine-Generators, Kw		1,239,970	673,050	428,900	551,190	524,580
Generators for Hydraulic Turbines, Kw		1,595,900*	1,099,100*	969,280*	15,010	209,340*
	TOTAL	16,437,989*	20,104,853*	5,877,090*	3,412,200*	8,653,774*
Steam Generators, 1,000 Lb Steam Per Hour		83,107	115,914	17,697	34,363	51,880
Nuclear Power Reactors (50,000 Kwe and Larger)		–	2,300,000	–	–	–
Hydraulic Turbines, Hp		117,000	4,024,280	16,000	17,600*	40,000
Power Transformers, Mva**		119,287	133,563	132,317	123,037	91,093

*Includes equipment on order with foreign manufacturers.

**Includes U.S. Industrials

Table XII MANUFACTURE OF ELECTRIC GENERATING EQUIPMENT – STEAM AND HYDRAULIC UNITS* – 4,000 Kw and Larger**

	Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed 1981
	1981	1982	1983	1984	1985	1986	1987 and Later		
U.S. Electric Power Systems									
Units	35	36	16	21	14	64	6	157	17
Kw	12,762,314	11,655,563	6,231,944	10,850,649	8,915,707	45,981,215	4,086,700	87,721,778	6,794,634
U.S. Industrials									
Units	15	16	4	2	2	–	–	24	16
Kw	376,795	270,690	121,872	79,000	78,800	–	–	550,362	290,490
Outside U.S.									
Units	12	12	16	5	1	1	1	36	14
Kw	2,346,175	3,261,675	8,066,745	2,595,070	647,000	647,000	980,000	16,197,490	4,012,992
Total									
Units	62	64	36	28	17	65	7	217	47
Kw	15,485,284	15,187,928	14,420,561	13,524,719	9,641,507	46,628,215	5,066,700	104,469,630	11,098,116

*Does not include combustion turbine-generators, but does include steam turbine-generators for nuclear power plants.
**Manufacturers' ratings

Table XIII MANUFACTURE OF STEAM TURBINE-GENERATORS – 4,000 Kw and Larger*

	Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed 1981
	1981	1982	1983	1984	1985	1986	1987 and Later		
U.S. Electric Power Systems									
Units	21	19	11	16	13	62	5	126	11
Kw	10,932,614	10,599,213	5,699,404	10,144,569	8,634,007	45,417,815	3,805,000	84,300,008	6,659,394
U.S. Industrials									
Units	15	16	4	2	2	–	–	24	16
Kw	376,795	270,690	121,872	79,000	78,800	–	–	550,362	290,490
Outside U.S.									
Units	11	12	16	5	1	1	1	36	14
Kw	2,157,175	3,261,675	8,066,745	2,595,070	647,000	647,000	980,000	16,197,490	4,012,992
Total									
Units	47	47	31	23	16	63	6	186	41
Kw	13,466,584	14,131,578	13,888,021	12,818,639	9,359,807	46,064,815	4,785,000	101,047,860	10,962,876

*Manufacturers' ratings

Table XIII-A MANUFACTURE OF CONVENTIONAL STEAM TURBINE-GENERATORS – 4,000 Kw and Larger* (INCLUDED IN TABLE XIII)

	Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed 1981
	1981	1982	1983	1984	1985	1986	1987 and Later		
U.S. Electric Power Systems									
Units	19	17	11	15	13	47	4	107	11
Kw	8,413,190	8,085,178	5,699,404	8,984,569	8,634,007	28,289,312	2,470,000	62,162,470	6,659,394
U.S. Industrials									
Units	15	16	4	2	2	–	–	24	16
Kw	376,795	270,690	121,872	79,000	78,800	–	–	550,362	290,490
Outside U.S.									
Units	10	11	12	4	1	1	–	29	12
Kw	1,349,500	2,454,000	4,558,574	1,888,574	647,000	647,000	–	10,195,148	2,600,000
Total									
Units	44	44	27	21	16	48	4	160	39
Kw	10,139,485	10,809,868	10,379,850	10,952,143	9,359,807	28,936,312	2,470,000	72,907,980	9,549,884
Orders to Foreign Manufacturers									
Units	4	6	6	1	3	–	–	16	12
Kw	716,000	688,500	876,960	505,000	1,010,000	–	–	3,080,460	1,260,460

*Manufacturers' ratings.

Table XIII-B MANUFACTURE OF NUCLEAR STEAM TURBINE-GENERATORS – 50,000 Kw and Larger* (INCLUDED IN TABLE XIII)

	Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed 1981
	1981	1982	1983	1984	1985	1986	1987 and Later		
U.S. Electric Power Systems									
Units	2	2	–	1	–	15	1	19	–
Kw	2,519,424	2,514,035	–	1,160,000	–	17,128,503	1,335,000	22,137,538	–
U.S. Industrials									
Units	–	–	–	–	–	–	–	–	–
Kw	–	–	–	–	–	–	–	–	–
Outside U.S.									
Units	1	1	4	1	–	–	1	7	2
Kw	807,675	807,675	3,508,171	706,496	–	–	980,000	6,002,342	1,412,992
Total									
Units	3	3	4	2	–	15	2	26	2
Kw	3,327,099	3,321,710	3,508,171	1,866,496	–	17,128,503	2,315,000	28,139,880	1,412,992
Orders to Foreign Manufacturers									
Units	1	–	–	–	–	–	–	–	–
Kw	1,268,516	–	–	–	–	–	–	–	–

*Manufacturers' ratings

Table XIV MANUFACTURE OF GENERATORS FOR HYDRAULIC TURBINES* – 4,000 Kw and Larger**

	Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed 1981
	1981	1982	1983	1984	1985	1986	1987 and Later		
U.S. Electric Power Systems									
Units	14	17	5	5	1	2	1	31	6
Kw	1,829,700	1,056,350	532,540	706,080	281,700	563,400	281,700	3,421,770	135,240
U.S. Industrials									
Units	–	–	–	–	–	–	–	–	–
Kw	–	–	–	–	–	–	–	–	–
Outside U.S.									
Units	1	–	–	–	–	–	–	–	–
Kw	189,000	–	–	–	–	–	–	–	–
Total									
Units	15	17	5	5	1	2	1	31	6
Kw	2,018,700	1,056,350	532,540	706,080	281,700	563,400	281,700	3,421,770	135,240
Orders to Foreign Manufacturers									
Units	8	–	2	–	–	–	–	2	7
Kw	163,300	–	10,000	–	–	–	–	10,000	74,100

*Includes generators for pumped-storage plants
**Manufacturers' ratings

Table XV MANUFACTURE OF CONVENTIONAL STEAM GENERATORS – 450 Psi Pressure and Higher

	Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed 1981
	1981	1982	1983	1984	1985	1986	1987 and Later		
U.S. Electric Power Systems									
Units	12	18	10	12	10	6	8	64	11
M Lb/Hr	36,496	67,611	45,888	55,242	50,344	30,866	46,491	296,442	51,880
U.S. Industrials									
Units	13	17	2	–	–	–	–	19	19
M Lb/Hr	5,524	5,173	1,184	–	–	–	–	6,357	6,357
Outside U.S.									
Units	7	10	5	1	2	1	–	19	9
M Lb/Hr	21,389	15,219	17,121	4,579	8,327	3,748	–	48,994	13,578
Total									
Units	32	45	17	13	12	7	8	102	39
M Lb/Hr	63,409	88,003	64,193	59,821	58,671	34,614	46,491	351,793	71,815

Table XVI MANUFACTURE OF HYDRAULIC TURBINES* – 5,000 Horsepower and Larger

	Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed 1981
	1981	1982	1983	1984	1985	1986	1987 and Later		
U.S. Electric Power Systems									
Units	10	2	3	8	5	–	4	22	1
Hp	883,000	16,800	153,620	2,253,060	1,176,000	–	1,380,000	4,979,480	40,000
U.S. Industrials									
Units	2	–	–	–	–	–	–	–	–
Hp	22,530	–	–	–	–	–	–	–	–
Outside U.S.									
Units	2	2	3	2	2	–	–	9	4
Hp	48,280	344,140	960,000	183,600	183,600	–	–	1,671,340	367,200
Total									
Units	14	4	6	10	7	–	4	31	5
Hp	953,810	360,940	1,113,620	2,436,660	1,359,600	–	1,380,000	6,650,820	407,200
Orders to Foreign Manufacturers									
Units	1	–	–	–	–	–	–	–	–
Hp	190,000	–	–	–	–	–	–	–	–

*Includes hydraulic turbines for pumped-storage plants.

Table XVII MANUFACTURE OF POWER TRANSFORMERS – 501 Kva and Larger

		Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed 1981
		1981	1982	1983	1984	1985	1986	1987 and Later		
501 to 10,000 Kva										
U.S. Electric Power Systems and U.S. Industrials	Units	5,133	2,611	55	193	13	13	53	2,938	4,996
	Mva	13,691	7,374	219	368	26	123	433	8,543	13,828
Outside U.S.	Units	317	346	–	3	–	–	5	354	470
	Mva	876	864	–	3	–	–	44	911	1,228
TOTAL	Units	5,450	2,957	55	196	13	13	58	3,292	5,466
	Mva	14,567	8,238	219	371	26	123	477	9,454	15,056
10,001 to 30,000 Kva										
U.S. Electric Power Systems and U.S. Industrials	Units	782	472	33	33	3	5	33	579	705
	Mva	21,489	12,688	1,058	1,159	92	186	810	15,993	18,347
Outside U.S.	Units	32	19	–	–	–	–	4	23	22
	Mva	789	398	–	–	–	–	97	495	430
TOTAL	Units	814	491	33	33	3	5	37	602	727
	Mva	22,278	13,086	1,058	1,159	92	186	907	16,488	18,777
30,001 to 100,000 Kva										
U.S. Electric Power Systems and U.S. Industrials	Units	291	186	43	24	12	6	39	310	246
	Mva	19,415	11,529	2,814	2,053	771	453	2,815	20,435	15,504
Outside U.S.	Units	18	4	–	2	–	–	–	6	8
	Mva	1,516	214	–	160	–	–	–	374	497
TOTAL	Units	309	190	43	26	12	6	39	316	254
	Mva	20,931	11,743	2,814	2,213	771	453	2,815	20,809	16,001
100,001 Kva and Larger										
U.S. Electric Power Systems and U.S. Industrials	Units	169	180	89	33	32	20	33	357	131
	Mva	60,242	60,157	22,495	12,115	14,520	7,343	12,420	129,050	43,414
Outside U.S.	Units	20	6	8	–	–	–	–	14	13
	Mva	7,976	2,768	3,464	–	–	–	–	6,232	4,976
TOTAL	Units	189	186	67	33	32	20	33	371	144
	Mva	68,118	62,925	25,959	12,115	14,520	7,343	12,420	135,282	48,390
Total (501 Kva and Larger)										
U.S. Electric Power Systems and U.S. Industrials	Units	6,375	3,449	190	283	60	44	158	4,184	6,078
	Mva	114,837	91,748	26,586	15,695	15,409	8,105	16,478	174,021	91,093
Outside U.S.	Units	387	375	8	5	–	–	9	397	513
	Mva	11,057	4,244	3,464	163	–	–	141	8,012	7,131
TOTAL	Units	6,762	3,824	198	288	60	44	167	4,581	6,591
	Mva	125,894	95,992	30,050	15,858	15,409	8,105	16,619	182,033	98,224

Table XVIII MANUFACTURE OF COMBUSTION TURBINE-GENERATORS – 4,000 Kw and Larger*

	Shipped	Scheduled as of January 1, 1982						Total Scheduled for Shipment as of 1-1-82	New Orders Placed
	1981	1982	1983	1984	1985	1986	1987 and Later		1981
U.S. Electric Power Systems									
Units	5	2	2	4	5	–	–	13	5
Kw	425,220	186,000	192,880	1,164,850	754,800	–	–	2,298,530	524,580
U.S. Industrials									
Units	–	7	1	–	–	–	–	8	8
Kw	–	613,140	96,440	–	–	–	–	709,580	709,580
Outside U.S.									
Units	7	10	–	–	–	–	–	10	6
Kw	501,440	831,840	–	–	–	–	–	831,840	517,990
Total									
Units	12	19	3	4	5	–	–	31	19
Kw	926,660	1,630,980	289,320	1,164,850	754,800	–	–	3,839,950	1,752,150

*Manufacturers' ratings

Table XIX MANUFACTURE OF NUCLEAR REACTORS – 50,000 Kwe and Larger*

	Completed	Scheduled as of January 1, 1982						Total Scheduled for Completion as of 1-1-82	New Orders Placed
	1981	1982	1983	1984	1985	1986	1987 and Later		1981
U.S. Electric Power Systems									
Units	3	9	15	11	6	12	39	92	–
Kwe	3,124,000	9,637,000	15,994,000	11,951,000	6,583,000	13,992,000	44,932,000	103,089,000	–
U.S. Industrials									
Units	1	7	6	8	1	3	7	32	–
Kwe	951,000	5,810,000	4,940,000	6,897,000	900,000	2,802,000	6,897,000	28,246,000	–
Total									
Units	4	16	21	19	7	15	46	124	–
Kwe	4,075,000	15,447,000	20,934,000	18,848,000	7,483,000	16,794,000	51,829,000	131,335,000	–

*Manufacturers' ratings

APPENDIX I/1981 ADDITIONS TO ELECTRIC GENERATING CAPACITY
U.S. Electric Power Systems—Units 4,000 Kw and Larger

SYMBOLS:

Investor-Owned I
Federal ..... F
Municipal ..... M
Cooperative C
State & Local ..... SL
Thermal
- Conventional steam turbine-generator ..... T
- Nuclear steam turbine-generator ..... N
- Combustion turbine-generator ..... G
- Diesel engine-generator ..... D

Hydraulic
- Hydraulic turbine-generator ..... H

Pumped-Storage
- Pumped-storage turbine-generator ..... S
- Reversible pumped-storage turbine-generator ..... R

Combined-Cycle
- Combustion turbine-generator for combined-cycle operation ..... GC
- Conventional steam turbine-generator for combined-cycle operation ..... TC

+ Denotes multiple ownership of the unit. In such cases, the name of the participating power system in whose service area the installation will be located is shown. In case the location does not fall within the service area of any of the participants, the name of the power system shown is the first in alphabetical order among the major participants.

NOTES: Kilowatts shown for individual generating units represent, in most cases, the net operating capability expected by the power systems; in other cases they represent the manufacturer's nameplate rating of the unit.

It is the convention in listing combined-cycle projects that the first line item is the combustion turbine-generator and the second line item is the steam turbine-generator. Combined-cycle operation is indicated by the symbols GC and TC in a brace:

GC }
TC }

NPCC

SYSTEM	STATION	OWNER-SHIP	TYPE	NET OPERATING CAPABILITY EXPECTED BY POWER SYSTEMS
MASSACHUSETTS MUNICIPAL WHOLESALE ELEC CORP	STONY BROOK ENERGY CENTER	M	GC	100,000
MASSACHUSETTS MUNICIPAL WHOLESALE ELEC CORP	STONY BROOK ENERGY CENTER	M	TC	252,820

MAAC

POTOMAC ELECTRIC POWER COMPANY	CHALK POINT NO. 4	I	T	600,000
+ PUBLIC SERVICE ELECTRIC & GAS COMPANY	SALEM NUCLEAR NO. 2	I	N	1,115,000

ECAR

BAY CITY MICHIGAN	MUNICIPAL POWER PLANT	M	D	5,500
COLUMBUS OHIO	REFUSE NO. 9	M	T	15,000
COLUMBUS OHIO	REFUSE NO. 10	M	T	15,000
COLUMBUS OHIO	REFUSE NO. 11	M	T	15,000
EAST KENTUCKY POWER COOPERATIVE	SPURLOCK NO. 2	C	T	500,000
KENTUCKY UTILITIES COMPANY	GHENT NO. 3	I	T	500,000
SOUTHERN INDIANA GAS & ELECTRIC COMPANY	BROADWAY NO. 2	I	G	70,000

SERC

SYSTEM	STATION	OWNER-SHIP	TYPE	NET OPERATING CAPABILITY EXPECTED BY POWER SYSTEMS
ALABAMA POWER COMPANY	FARLEY NO. 2	I	N	807,000
DUKE POWER COMPANY	McGUIRE NO. 1	I	N	1,180,000
FAYETTEVILLE NORTH CAROLINA	GAS TURBINE NO. 8	M	G	23,500
FLORIDA POWER & LIGHT COMPANY	MARTIN NO. 2	I	T	775,000
GAINESVILLE FLORIDA	DEERHAVEN NO. 2	M	T	235,000
MISSISSIPPI POWER COMPANY	PLANT DANIEL NO. 2	I	T	503,000
SOUTH CAROLINA PUBLIC SERVICE AUTHORITY	WINYAH NO. 4	SL	T	280,000
TENNESSEE VALLEY AUTHORITY	SEQUOYAH NO. 1	F	N	1,148,000

MAIN

SIKESTON MISSOURI	COLEMAN NO. 2	M	T	235,000
WISCONSIN PUBLIC SERVICE CORPORATION	WESTON NO. 3	I	T	300,000

SPP

ARKANSAS POWER & LIGHT COMPANY	WHITE BLUFF NO. 2	I	T	816,000
AUGUSTA KANSAS	MUNICIPAL LIGHT PLANT	M	D	6,000
CAJUN ELECTRIC POWER COOPERATIVE	BIG CAJUN TWO NO. 2	C	T	540,000
EMPIRE DISTRICT ELECTRIC COMPANY	EMPIRE ENERGY CENTER	I	G	90,000
GRAND RIVER DAM AUTHORITY	CHOUTEAU NO. 1	SL	T	490,000
KANSAS CITY KANSAS	NEARMAN NO. 1	M	T	235,000
MISSOURI PUBLIC SERVICE COMPANY	RALPH GREEN NO. 3	I	G	79,000

ERCOT

SYSTEM	STATION	OWNER-SHIP	TYPE	NET OPERATING CAPABILITY EXPECTED BY POWER SYSTEMS
+ TEXAS UTILITITES COMPANY SYSTEM	SANDOW NO. 4	I	T	545 000

MARCA

+ BASIN ELECTRIC POWER COOPERATIVE	LARAMIE RIVER NO. 2	C	T	550,000
FALLS CITY NEBRASKA	MUNICIPAL LIGHT PLANT	M	D	6,000
HASTINGS NEBRASKA	ENERGY CENTER NO. 1	M	T	70,000
+ IOWA SOUTHERN UTILITIES COMPANY	OTTUMWA NO. 1	I	T	675,000
+ OTTER TAIL POWER COMPANY	COYOTE NO. 1	I	T	410,000

WSCC

ARIZONA PUBLIC SERVICE COMPANY	CHOLLA NO. 4	I	T	347,000
MODESTO IRRIGATION DISTRICT	McCLURE B	SL	G	49,000
PUBLIC SERVICE COMPANY OF COLORADO	PAWNEE NO. 1	I	T	470,000
PUGET SOUND POWER & LIGHT COMPANY	FREDERICKSON WASHINGTON	I	G	178,200
PUGET SOUND POWER & LIGHT COMPANY	WHITEHORN NOS. 2&3	I	G	178,000
SIERRA PACIFIC POWER COMPANY	VALMY NO. 1	I	T	250,000
U.S. ARMY CORPS OF ENGINEERS	BONNEVILLE DAM F-1	F	H	15,000
U.S. ARMY CORPS OF ENGINEERS	BONNEVILLE DAM F-2	F	H	15,000
U.S. ARMY CORPS OF ENGINEERS	BONNEVILLE DAM NO. 18	F	H	76,000
U.S. ARMY CORPS OF ENGINEERS	BONNEVILLE DAM NO. 17	F	H	76,000
U.S. BUREAU OF RECLAMATION	MT. ELBERT NO. 1	F	H	100,000

FORTY-FIVE GENERATING UNITS WERE ADDED IN 1981 WITH TOTAL NET EXPECTED CAPABILITY OF 14,941,020 KW

APPENDIX II/STATISTICS CONCERNING THE MANUFACTURE OF HEAVY ELECTRIC POWER EQUIPMENT

Table A ELECTRIC GENERATING EQUIPMENT, STEAM AND HYDRAULIC UNITS – 4,000 Kw and Larger

Period		Shipped During Period To				Ordered During Period By*				Scheduled for Shipment at End of Period To			
		U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total Shipments	U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total New Orders	U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total
1979													
1st Quarter	Units	10	1	2	13	6	3	2	11	262	22	27	311
	Kw	4,079,312	4,400	1,737,675	5,821,387	2,417,800	60,000	1,125,964	3,603,764	167,300,630	441,600	10,461,857	178,204,084
2nd Quarter	Units	17	6	3	26	7	4	5	16	240	20	28	288
	Kw	11,157,904	113,800	675,000	11,946,704	629,694	89,000	529,000	1,247,694	149,693,883	396,800	10,307,254	160,397,937
3rd Quarter	Units	9	5	4	18	5	1	7	13	228	16	32	276
	Kw	3,896,970	59,400	383,300	4,339,670	2,322,496	35,000	1,734,376	4,091,872	141,252,581	372,400	11,658,330	153,283,311
4th Quarter	Units	12	3	1	16	–	–	–	–	225	15	38	278
	Kw	6,499,653	73,500	1,076,000	7,649,153	–	–	–	–	134,680,404	321,400	13,851,330	148,853,134
Total – 1979	Units	48	15	10	73	18	8	14	40				
	Kw	25,633,839	251,100	3,871,975	29,756,314	5,369,990	184,000	3,389,340	8,943,330				
1980													
1st Quarter	Units	3	3	5	11	2	6	–	8	224	18	33	275
	Kw	2,236,316	30,900	1,993,836	4,261,052	1,065,000	137,850	–	1,202,850	134,019,088	428,350	11,857,494	146,304,932
2nd Quarter	Units	5	2	5	12	–	5	2	7	219	21	30	270
	Kw	3,895,012	20,000	1,197,339	5,112,351	–	149,317	572,000	721,317	130,124,076	557,667	11,232,155	141,913,898
3rd Quarter	Units	12	2	7	21	–	4	1	5	206	23	24	253
	Kw	3,524,976	55,000	1,012,000	4,591,976	–	137,000	135,000	272,000	125,838,750	639,667	10,355,155	136,833,572
4th Quarter	Units	13	3	6	22	4	4	7	15	192	22	32	246
	Kw	5,144,729	89,000	1,922,754	7,156,483	1,296,010	44,000	2,037,500	3,377,510	115,297,888	594,667	13,830,673	129,723,228
Total – 1980	Units	33	10	23	66	6	19	10	35				
	Kw	14,801,033	194,900	6,125,929	21,121,862	2,361,010	468,167	2,744,500	5,573,677				
1981													
1st Quarter	Units	7	1	3	11	10	–	2	12	180	21	31	232
	Kw	2,977,725	10,000	219,000	3,206,725	4,597,240	–	1,412,992	6,010,232	98,273,591	584,667	15,024,665	113,882,923
2nd Quarter	Units	9	6	2	17	3	11	5	19	169	26	32	227
	Kw	2,607,689	123,750	313,000	3,044,439	1,710,394	170,340	240,000	2,120,734	94,655,984	631,257	13,851,665	109,138,906
3rd Quarter	Units	10	5	2	17	3	3	4	10	164	23	36	223
	Kw	2,593,236	151,045	829,675	3,573,956	440,000	92,650	1,400,000	1,932,650	94,498,558	547,862	15,521,990	110,568,410
4th Quarter	Units	9	3	5	17	1	2	3	6	149	24	36	209
	Kw	4,583,664	92,000	984,500	5,660,164	47,000	27,500	960,000	1,034,500	85,725,098	550,362	16,197,490	102,472,950
Total – 1981	Units	35	15	12	62	17	16	14	47				
	Kw	12,762,314	376,795	2,346,175	15,485,284	6,794,634	290,490	4,012,992	11,098,116				

*Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for changes in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.

Table B CONVENTIONAL STEAM TURBINE-GENERATORS – 4,000 Kw and Larger

Period		Shipped During Period To: U.S. Electric Power Systems	Shipped During Period To: U.S. Industrials	Shipped During Period To: Outside U.S.	Shipped During Period To: Total Shipments	Ordered During Period By*: U.S. Electric Power Systems	Ordered During Period By*: U.S. Industrials	Ordered During Period By*: Outside U.S.	Ordered During Period By*: Total New Orders	Scheduled for Shipment at End of Period To: U.S. Electric Power Systems	Scheduled for Shipment at End of Period To: U.S. Industrials	Scheduled for Shipment at End of Period To: Outside U.S.	Scheduled for Shipment at End of Period To: Total
1979													
1st Quarter	Units	6	1	–	7	3	3	2	8	145	22	14	181
	Kw	2,633,938	4,400	–	2,638,338	1,570,000	60,000	1,125,964	2,755,964	79,121,895	441,600	1,698,709	81,262,204
2nd Quarter	Units	7	6	2	15	2	4	5	11	141	20	17	178
	Kw	3,244,229	113,800	25,000	3,383,029	586,414	89,000	529,000	1,204,414	76,838,890	396,800	2,194,109	79,429,799
3rd Quarter	Units	6	5	4	15	5	1	7	13	134	16	20	170
	Kw	2,562,747	59,400	383,300	3,005,447	2,322,496	35,000	1,734,376	4,091,872	72,103,811	372,400	3,545,185	76,021,396
4th Quarter	Units	8	3	–	11	–	–	–	–	135	15	25	175
	Kw	3,939,102	73,500	–	4,012,602	–	–	–	–	73,459,980	321,400	4,820,185	78,601,565
Total – 1979	Units	27	15	6	48	10	8	14	32				
	Kw	12,380,016	251,100	408,300	13,039,416	4,478,910	184,000	3,389,340	8,052,250				
1980													
1st Quarter	Units	2	3	3	8	2	6	–	8	134	18	22	174
	Kw	1,061,316	30,900	67,470	1,159,686	1,065,000	137,850	–	1,202,850	72,798,664	428,350	4,752,715	77,979,729
2nd Quarter	Units	3	2	5	10	–	5	2	7	131	21	19	171
	Kw	1,360,588	20,000	1,197,339	2,577,927	–	149,317	572,000	721,317	71,438,076	557,667	4,127,376	76,123,119
3rd Quarter	Units	8	2	5	15	–	4	1	5	123	23	15	161
	Kw	3,028,866	55,000	634,000	3,717,866	–	137,000	135,000	272,000	68,817,104	639,667	3,628,376	73,085,147
4th Quarter	Units	8	3	4	15	3	4	7	14	114	22	25	161
	Kw	4,298,619	89,000	782,000	5,169,619	1,281,000	44,000	2,037,500	3,362,500	62,935,999	594,667	8,244,648	71,775,314
Total – 1980	Units	21	10	17	48	5	19	10	34				
	Kw	9,749,389	194,900	2,680,809	12,625,098	2,346,000	468,167	2,744,500	5,558,667				
1981													
1st Quarter	Units	6	1	2	9	6	–	–	6	114	21	23	158
	Kw	2,627,725	10,000	30,000	2,667,725	4,487,000	–	–	4,487,000	64,112,539	584,667	8,214,648	72,911,854
2nd Quarter	Units	5	6	2	13	3	11	5	19	108	26	24	158
	Kw	1,813,189	123,750	313,000	2,249,939	1,710,394	170,340	240,000	2,120,734	61,973,335	631,257	7,041,648	69,646,240
3rd Quarter	Units	5	5	1	11	1	3	4	8	106	23	29	158
	Kw	2,465,536	151,045	22,000	2,638,581	415,000	92,650	1,400,000	1,907,650	61,918,609	547,862	9,519,648	71,986,119
4th Quarter	Units	3	3	5	11	1	2	3	6	107	24	29	160
	Kw	1,506,740	92,000	984,500	2,583,240	47,000	27,500	960,000	1,034,500	62,162,470	550,362	10,195,148	72,907,980
Total – 1981	Units	19	15	10	44	11	16	12	39				
	Kw	8,413,190	376,795	1,349,500	10,139,485	6,659,394	290,490	2,600,000	9,549,884				

* Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for changes in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.

Table C NUCLEAR STEAM TURBINE-GENERATORS – 50,000 Kw and Larger

Period		Shipped During Period To			Ordered During Period By*			Scheduled for Shipment at End of Period To		
		U.S. Electric Power Systems	Outside U.S.	Total Shipments	U.S. Electric Power Systems	Outside U.S.	Total New Orders	U.S. Electric Power Systems	Outside U.S.	Total
1979										
1st Quarter	Units	1	2	3	–	–	–	68	9	77
	Kw	1,359,424	1,737,675	3,097,099	–	–	–	79,808,303	8,007,145	87,815,448
2nd Quarter	Units	6	1	7	–	–	–	57	8	65
	Kw	7,487,675	650,000	8,137,675	–	–	–	66,724,881	7,357,145	74,082,026
3rd Quarter	Units	1	–	1	–	–	–	54	8	62
	Kw	1,205,091	–	1,205,091	–	–	–	63,147,790	7,357,145	70,504,935
4th Quarter	Units	2	1	3	–	–	–	46	9	55
	Kw	2,427,551	1,076,000	3,503,551	–	–	–	54,872,944	8,275,145	63,148,089
Total – 1979	Units	10	45	14	–	–	–			
	Kw	12,479,741	3,463,675	15,943,416	–	–	–			
1980										
1st Quarter	Units	1	2	3	–	–	–	46	7	53
	Kw	1,175,000	1,926,366	3,101,366	–	–	–	54,872,947	6,348,779	61,221,723
2nd Quarter	Units	2	–	2	–	–	–	44	7	51
	Kw	2,534,424	–	2,534,424	–	–	–	52,338,520	6,348,779	58,687,299
3rd Quarter	Units	–	–	–	–	–	–	43	7	50
	Kw	–	–	–	–	–	–	51,170,276	6,348,779	57,519,055
4th Quarter	Units	–	1	1	–	–	–	40	6	46
	Kw	–	951,754	951,754	–	–	–	47,325,659	5,397,025	52,722,684
Total – 1980	Units	3	3	6	–	–	–			
	Kw	3,709,424	2,878,120	6,587,544	–	–	–			
1981										
1st Quarter	Units	–	–	–	–	2	2	25	8	33
	Kw	–	–	–	–	1,412,992	1,412,992	29,364,582	6,810,017	36,174,599
2nd Quarter	Units	–	–	–	–	–	–	24	8	32
	Kw	–	–	–	–	–	–	28,680,679	6,810,017	35,490,696
3rd Quarter	Units	–	1	1	–	–	–	24	7	31
	Kw	–	807,675	807,675	–	–	–	28,680,679	6,002,342	34,683,021
4th Quarter	Units	2	–	2	–	–	–	19	7	26
	Kw	2,519,424	–	2,519,424	–	–	–	22,137,538	6,002,342	28,139,880
Total – 1981	Units	2	1	3	–	2	2			
	Kw	2,519,424	807,675	3,327,099	–	1,412,992	1,412,992			

*Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for changes in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.

Table D GENERATORS FOR HYDRAULIC TURBINES – 4,000 Kw and Larger

Period		Shipped During Period To: U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total Shipments	Ordered During Period By*: U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total New Orders	Scheduled for Shipment at End of Period To: U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total
1979													
1st Quarter	Units	3	–	–	3	3	–	–	3	49	–	4	53
	Kw	85,950	–	–	85,950	847,800	–	–	847,800	8,370,432	–	756,000	9,126,432
2nd Quarter	Units	4	–	–	4	5	–	–	5	42	–	4	46
	Kw	426,000	–	–	426,000	43,280	–	–	43,280	6,130,112	–	756,000	6,886,112
3rd Quarter	Units	2	–	–	2	–	–	–	–	40	–	4	44
	Kw	129,132	–	–	129,132	–	–	–	–	6,000,980	–	756,000	6,756,980
4th Quarter	Units	2	–	–	2	–	–	–	–	44	–	4	48
	Kw	133,000	–	–	133,000	–	–	–	–	6,347,480	–	756,000	7,103,480
Total – 1979	Units	11	–	–	11	8	–	–	8				
	Kw	774,082	–	–	775,082	891,080	–	–	891,080				
1980													
1st Quarter	Units	–	–	–	–	–	–	–	–	44	–	4	48
	Kw	–	–	–	–	–	–	–	–	6,347,480	–	756,000	7,103,480
2nd Quarter	Units	–	–	–	–	–	–	–	–	44	–	4	48
	Kw	–	–	–	–	–	–	–	–	6,347,480	–	756,000	7,103,480
3rd Quarter	Units	4	–	2	6	–	–	–	–	40	–	2	42
	Kw	496,110	–	378,000	874,110	–	–	–	–	5,851,370	–	378,000	6,229,370
4th Quarter	Units	5	–	1	6	1	–	–	1	38	–	1	39
	Kw	846,110	–	189,000	1,035,110	15,010	–	–	15,010	5,036,230	–	189,000	5,225,230
Total – 1980	Units	9	–	3	12	1	–	–	1				
	Kw	1,342,220	–	567,000	1,909,220	15,010	–	–	15,010				
1981													
1st Quarter	Units	1	–	1	2	4	–	–	4	41	–	–	41
	Kw	350,000	–	189,000	539,000	110,240	–	–	110,240	4,796,470	–	–	4,796,470
2nd Quarter	Units	4	–	–	4	–	–	–	–	37	–	–	37
	Kw	794,500	–	–	794,500	–	–	–	–	4,001,970	–	–	4,001,970
3rd Quarter	Units	5	–	–	5	2	–	–	2	34	–	–	34
	Kw	127,700	–	–	127,700	25,000	–	–	25,000	3,899,270	–	–	3,899,270
4th Quarter	Units	4	–	–	4	–	–	–	–	31	–	–	31
	Kw	557,500	–	–	557,500	–	–	–	–	3,421,770	–	–	3,421,770
Total – 1981	Units	14	–	1	15	6	–	–	6				
	Kw	1,829,700	–	189,000	2,018,700	135,240	–	–	135,240				

*Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for change in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.

Table E CONVENTIONAL STEAM GENERATORS – 450 Psi Pressure and Higher

Period		Shipped During Period To				Ordered During Period By*				Scheduled for Shipment at End of Period To			
		U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total Shipments	U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total New Orders	U.S. Electric Power Systems	U.S. Industrials	Outside U.S.	Total
1979													
1st Quarter	Units	6	6	1	13	1	1	2	4	78	8	16	102
	Mlb/Hr	15,402	4,605	1,499	21,506	4,100	300	7,922	12,322	336,240	1,830	36,756	374,826
2nd Quarter	Units	7	3	1	11	6	1	5	12	77	6	20	103
	Mlb/Hr	28,413	860	1,543	30,816	13,597	180	3,602	17,379	321,537	1,150	38,815	361,502
3rd Quarter	Units	4	2	5	11	–	–	–	–	73	4	15	92
	Mlb/Hr	8,471	480	11,777	20,728	–	–	–	–	313,076	670	27,038	340,784
4th Quarter	Units	4	1	4	9	–	–	–	–	73	5	13	91
	Mlb/Hr	13,516	155	6,360	20,031	–	–	–	–	316,273	1,595	21,438	339,306
Total – 1979	Units	21	12	11	44	7	2	7	16				
	Mlb/Hr	65,802	6,100	21,179	93,081	17,697	480	11,524	29,701				
1980													
1st Quarter	Units	5	–	2	7	–	8	4	12	68	13	15	96
	Mlb/Hr	19,221	–	1,807	21,028	–	3,610	10,712	14,322	297,052	5,205	30,343	332,600
2nd Quarter	Units	6	3	4	13	3	6	2	11	65	11	11	87
	Mlb/Hr	26,190	1,235	6,198	33,623	10,188	3,035	7,496	20,719	281,060	4,105	24,145	309,310
3rd Quarter	Units	–	3	4	7	2	1	1	4	67	14	10	91
	Mlb/Hr	–	660	5,391	6,051	5,413	150	1,186	6,749	286,463	6,495	27,436	320,394
4th Quarter	Units	8	3	–	11	4	2	2	8	63	13	14	90
	Mlb/Hr	40,067	1,505	–	41,572	58,762	534	1,100	60,396	305,628	5,524	29,436	340,588
Total – 1980	Units	19	9	10	38	9	17	9	35				
	Mlb/Hr	85,478	3,400	13,396	102,274	74,363	7,329	20,494	102,186				
1981													
1st Quarter	Units	4	4	–	8	1	3	–	4	60	12	15	87
	Mlb/Hr	10,753	1,955	–	12,708	3,800	950	–	4,750	258,675	4,519	45,472	308,666
2nd Quarter	Units	4	5	4	13	9	5	3	17	65	12	13	90
	Mlb/Hr	12,207	2,085	14,501	28,793	44,280	2,334	6,841	53,455	294,623	4,768	35,408	334,799
3rd Quarter	Units	4	1	1	6	1	11	6	18	61	22	18	101
	Mlb/Hr	13,536	800	2,400	16,736	3,800	3,073	6,737	13,610	280,342	7,041	39,745	327,128
4th Quarter	Units	–	3	2	5	–	–	–	–	64	19	19	102
	Mlb/Hr	–	684	4,488	5,172	–	–	–	–	296,442	6,357	48,994	351,793
Total – 1981	Units	12	13	7	32	11	19	9	39				
	Mlb/Hr	36,496	5,524	21,389	63,409	51,880	6,357	13,578	71,815				

*Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for change in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.

Table F HYDRAULIC TURBINES – 5,000 Horsepower and Larger

Period		Shipped During Period To: U.S. Electric Power Systems	Shipped During Period To: U.S. Industrials	Shipped During Period To: Outside U.S.	Shipped During Period To: Total Shipments	Ordered During Period By*: U.S. Electric Power Systems	Ordered During Period By*: U.S. Industrials	Ordered During Period By*: Outside U.S.	Ordered During Period By*: Total New Orders	Scheduled for Shipment at End of Period To: U.S. Electric Power Systems	Scheduled for Shipment at End of Period To: U.S. Industrials	Scheduled for Shipment at End of Period To: Outside U.S.	Scheduled for Shipment at End of Period To: Total
1979													
1st Quarter	Units	–	–	1	1	–	–	–	–	29	2	4	35
	Hp	–	–	250,000	250,000	–	–	–	–	6,314,780	22,530	322,420	6,659,730
2nd Quarter	Units	1	–	–	1	1	–	–	1	29	2	4	35
	Hp	50,600	–	–	50,600	16,000	–	–	16,000	6,280,180	22,530	322,420	6,625,130
3rd Quarter	Units	–	–	–	–	–	–	–	–	29	2	4	35
	Hp	–	–	–	–	–	–	–	–	6,280,180	22,530	322,420	6,625,130
4th Quarter	Units	–	–	–	–	–	–	–	–	29	2	4	35
	Hp	–	–	–	–	–	–	–	–	6,280,180	22,530	322,420	6,625,130
Total – 1979	Units	1	–	1	2	1	–	–	1				
	Hp	50,600	–	250,000	300,600	16,000	–	–	16,000				
1980													
1st Quarter	Units	–	–	–	–	–	–	–	–	29	2	4	35
	Hp	–	–	–	–	–	–	–	–	6,280,180	22,530	322,420	6,625,130
2nd Quarter	Units	1	–	1	2	–	–	–	–	29	2	4	35
	Hp	105,000	–	250,000	355,000	–	–	–	–	6,280,180	22,530	322,420	6,625,130
3rd Quarter	Units	3	–	–	3	–	–	4	4	25	2	7	34
	Hp	375,000	–	–	375,000	–	–	1,280,000	1,280,000	5,800,180	22,530	1,352,420	7,175,130
4th Quarter	Units	2	–	–	2	–	–	–	–	26	2	7	35
	Hp	270,000	–	–	270,000	–	–	–	–	5,562,480	22,530	1,352,420	6,937,430
Total – 1980	Units	6	–	1	7	–	–	4	4				
	Hp	750,000	–	250,000	1,000,000	–	–	1,280,000	1,280,000				
1981													
1st Quarter	Units	2	2	–	4	–	–	–	–	24	–	7	31
	Hp	210,000	22,530	–	232,530	–	–	–	–	5,352,480	–	1,352,420	6,704,900
2nd Quarter	Units	4	–	–	4	–	–	4	4	20	–	11	31
	Hp	474,000	–	–	474,000	–	–	367,200	367,200	4,878,480	–	1,719,620	6,598,100
3rd Quarter	Units	2	–	–	2	–	–	–	–	18	–	11	29
	Hp	55,000	–	–	55,000	–	–	–	–	4,823,480	–	1,719,620	6,543,100
4th Quarter	Units	2	–	2	4	1	–	–	1	22	–	9	31
	Hp	144,000	–	48,280	192,280	40,000	–	–	40,000	4,979,480	–	1,671,340	6,650,820
Total – 1981	Units	10	2	2	14	1	–	4	5				
	Hp	883,000	22,530	48,280	953,810	40,000	–	367,200	407,200				

*Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for change in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.

Table G POWER TRANSFORMERS – 501 Kva and Larger

Period		Shipped During Period To: U.S. Electric Power Systems and U.S. Industrials	Shipped During Period To: Outside U.S.	Shipped During Period To: Total Shipments	Ordered During Period By*: U.S. Electric Power Systems and U.S. Industrials	Ordered During Period By*: Outside U.S.	Ordered During Period By*: Total New Orders	Scheduled for Shipment at End of Period To: U.S. Electric Power Systems and U.S. Industrials	Scheduled for Shipment at End of Period To: Outside U.S.	Scheduled for Shipment at End of Period To: Total
1979										
1st Quarter	Units	1,835	62	1,897	2,055	69	2,124	4,605	195	4,800
	Mva	31,424	649	32,073	35,363	961	36,324	251,390	4,092	255,482
2nd Quarter	Units	1,986	67	2,053	1,689	68	1,757	4,567	146	4,713
	Mva	38,709	512	39,221	37,308	785	38,093	267,061	6,129	273,190
3rd Quarter	Units	1,577	62	1,639	1,944	100	2,044	4,913	178	5,091
	Mva	28,096	568	28,664	28,109	4,831	32,940	267,289	9,505	276,794
4th Quarter	Units	1,685	50	1,735	1,654	146	1,800	4,698	253	4,951
	Mva	38,122	788	38,910	31,537	2,076	33,613	272,218	9,083	281,301
Total – 1979	Units	7,083	241	7,324	7,342	383	7,725			
	Mva	136,351	2,517	138,868	132,317	8,653	140,970			
1980										
1st Quarter	Units	1,900	80	1,980	2,015	149	2,164	4,711	327	5,038
	Mva	37,567	2,676	40,243	40,325	9,146	49,471	256,259	15,682	271,941
2nd Quarter	Units	1,764	110	1,874	1,297	120	1,417	4,951	344	5,295
	Mva	36,353	3,016	39,369	31,444	456	31,900	258,527	14,179	272,706
3rd Quarter	Units	1,623	100	1,723	1,571	57	1,628	5,066	328	5,394
	Mva	31,733	2,193	33,926	30,107	1,389	31,496	253,259	12,676	265,935
4th Quarter	Units	1,672	129	1,801	1,444	118	1,562	4,648	296	4,944
	Mva	40,785	1,031	41,816	21,161	618	21,779	235,245	12,532	247,777
Total – 1980	Units	6,959	419	7,378	6,327	444	6,771			
	Mva	146,438	8,916	155,354	123,037	11,609	134,646			
1981										
1st Quarter	Units	1,764	94	1,858	1,706	87	1,793	4,564	263	4,827
	Mva	30,765	845	31,610	28,943	773	29,716	233,959	12,091	246,050
2nd Quarter	Units	1,641	117	1,758	1,436	103	1,539	4,305	273	4,578
	Mva	25,999	1,540	27,539	23,534	1,104	24,638	228,986	11,510	240,496
3rd Quarter	Units	1,529	94	1,623	1,269	159	1,628	4,054	333	4,387
	Mva	26,044	6,151	32,195	17,968	1,243	19,211	196,828	6,557	203,385
4th Quarter	Units	1,441	82	1,523	1,467	164	1,631	4,184	397	4,581
	Mva	32,029	2,521	34,550	20,648	4,011	24,659	174,021	8,012	182,033
Total – 1981	Units	6,375	387	6,762	6,078	513	6,591			
	Mva	114,837	11,057	125,894	91,093	7,131	98,224			

* Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for change in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.

Table H COMBUSTION TURBINE-GENERATORS – 4,000 Kw and Larger

Period		Shipped During Period To: U.S. Electric Power Systems	Shipped During Period To: U.S. Industrials	Shipped During Period To: Outside U.S.	Shipped During Period To: Total Shipments	Ordered During Period By*: U.S. Electric Power Systems	Ordered During Period By*: U.S. Industrials	Ordered During Period By*: Outside U.S.	Ordered During Period By*: Total New Orders	Scheduled for Shipment at End of Period To: U.S. Electric Power Systems	Scheduled for Shipment at End of Period To: U.S. Industrials	Scheduled for Shipment at End of Period To: Outside U.S.	Scheduled for Shipment at End of Period To: Total
1979													
1st Quarter	Units	4	1	5	10	4	–	2	6	42	4	11	57
	Kw	261,800	30,000	266,700	558,500	283,300	–	62,790	346,090	4,177,030	204,000	1,132,660	5,513,690
2nd Quarter	Units	–	–	3	3	1	–	1	2	40	–	9	49
	Kw	–	–	125,290	125,290	145,600	–	124,000	269,600	4,229,430	–	1,131,370	5,360,800
3rd Quarter	Units	4	–	3	7	–	–	–	–	21	–	8	29
	Kw	288,170	–	571,007	859,177	–	–	–	–	2,967,660	–	539,950	3,507,610
4th Quarter	Units	5	–	10	15	–	–	–	–	16	–	8	24
	Kw	297,000	–	373,320	670,320	–	–	–	–	2,670,660	–	530,530	3,201,190
Total – 1979	Units	13	1	21	35	5	–	3	8				
	Kw	846,970	30,000	1,336,317	2,213,287	428,900	–	186,790	615,690				
1980													
1st Quarter	Units	–	–	2	2	1	–	1	2	17	–	7	24
	Kw	–	–	65,790	65,790	145,600	–	30,000	175,600	2,816,260	–	494,740	3,311,000
2nd Quarter	Units	1	–	–	1	2	–	3	5	18	–	8	26
	Kw	145,600	–	–	145,600	154,940	–	240,700	395,640	2,802,160	–	544,540	3,346,700
3rd Quarter	Units	3	–	11	14	2	–	7	9	19	–	6	25
	Kw	186,000	–	870,120	1,056,120	151,700	–	484,730	636,430	2,864,300	–	350,050	3,214,350
4th Quarter	Units	5	–	7	12	2	–	9	11	15	–	9	24
	Kw	310,180	–	490,340	800,520	98,950	–	830,160	929,110	2,580,070	–	276,720	3,322,440
Total – 1980	Units	9	–	20	29	7	–	20	27				
	Kw	641,780	–	1,426,250	2,068,030	551,190	–	1,585,590	2,136,780				
1981													
1st Quarter	Units	3	–	3	6	1	3	–	4	13	3	6	22
	Kw	183,180	–	228,670	411,850	26,050	289,320	–	315,370	2,422,940	289,320	513,700	3,225,960
2nd Quarter	Units	1	–	1	2	–	–	1	1	11	3	6	20
	Kw	145,600	–	52,500	198,100	–	–	35,790	35,790	1,969,340	289,320	496,990	2,755,650
3rd Quarter	Units	1	–	3	4	1	2	5	8	10	5	8	23
	Kw	96,440	–	220,270	316,710	81,150	130,940	482,200	694,290	1,881,150	420,260	758,920	3,060,330
4th Quarter	Units	–	–	–	–	3	3	–	6	13	8	10	31
	Kw	–	–	–	–	417,380	289,320	–	706,700	2,298,530	709,580	831,840	3,839,950
Total – 1981	Units	5	–	7	12	5	8	6	19				
	Kw	425,220	–	501,440	926,660	524,580	709,580	517,990	1,752,150				

*Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for change in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.

Table I NUCLEAR REACTORS – 50,000 Kwe and Larger

Period		Completed During Period For			Ordered During Period By*			Scheduled for Completion at End of Period To		
		U.S. Electric Power Systems	Outside U.S.	Total Shipments	U.S. Electric Power Systems	Outside U.S.	Total New Orders	U.S. Electric Power Systems	Outside U.S.	Total
1979										
1st Quarter	Units	–	–	–	–	–	–	122	38	160
	Kwe	–	–	–	–	–	–	134,846,000	34,032,000	168,878,000
2nd Quarter	Units	1	–	1	–	–	–	118	38	156
	Kwe	330,000	–	330,000	–	–	–	131,016,000	34,032,000	165,048,000
3rd Quarter	Units	–	2	2	–	–	–	113	36	149
	Kwe	–	1,732,000	1,732,000	–	–	–	125,343,000	32,102,000	157,445,000
4th Quarter	Units	–	1	1	–	–	–	109	37	146
	Kwe	–	1,067,000	1,067,000	–	–	–	120,627,000	32,835,500	153,462,000
Total – 1979	Units	1	3	4	–	–	–			
	Kwe	330,000	2,799,000	3,129,000	–	–	–			
1980										
1st Quarter	Units	1	–	1	–	–	–	108	37	145
	Kwe	950,000	–	950,000	–	–	–	119,677,000	32,835,000	152,512,000
2nd Quarter	Units	–	–	–	–	–	–	108	37	145
	Kwe	–	–	–	–	–	–	119,667,000	32,835,000	152,512,000
3rd Quarter	Units	1	1	2	–	–	–	103	36	139
	Kwe	907,000	912,000	1,819,000	–	–	–	114,670,000	31,941,000	146,611,000
4th Quarter	Units	1	1	2	–	–	–	101	35	136
	Kwe	1,148,000	840,000	1,988,000	–	–	–	112,615,000	31,101,000	143,716,000
Total – 1980	Units	3	2	5	–	–	–			
	Kwe	3,005,000	1,752,000	4,757,000	–	–	–			
1981										
1st Quarter	Units	–	–	–	–	–	–	100	35	135
	Kwe	–	–	–	–	–	–	111,425,000	31,146,000	142,571,000
2nd Quarter	Units	–	–	–	–	–	–	100	35	135
	Kwe	–	–	–	–	–	–	111,425,000	31,101,000	142,526,000
3rd Quarter	Units	1	–	1	–	–	–	94	33	127
	Kwe	829,000	–	829,000	–	–	–	105,381,000	29,197,000	134,578,000
4th Quarter	Units	2	1	3	–	–	–	92	32	124
	Kwe	2,295,000	951,000	3,246,000	–	–	–	103,089,000	28,246,000	131,335,000
Total – 1981	Units	3	1	4	–	–	–			
	Kwe	3,124,000	951,000	4,075,000	–	–	–			

*Data in these tables concerning the number and aggregate capacity of units ordered during each quarter of a calendar year have been adjusted to account for change in ratings, for cancellations and any other changes that occurred during that calendar year, but no adjustments are made for changes occurring after the close of the year.